

Arizona Game and Fish Department

**Ben Avery**

*Shooting Facility Master Plan*



LOGAN SIMPSON  
DESIGN INC.

Approved by Arizona Game and Fish Commission on December 8, 2007



# **Arizona Game and Fish Department Ben Avery Shooting Facility Master Plan**

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Approved December 8, 2007

# BEN AVERY SHOOTING FACILITY MASTER PLAN

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## 1.0 PROJECT OVERVIEW

### 1.1 Background and Purpose

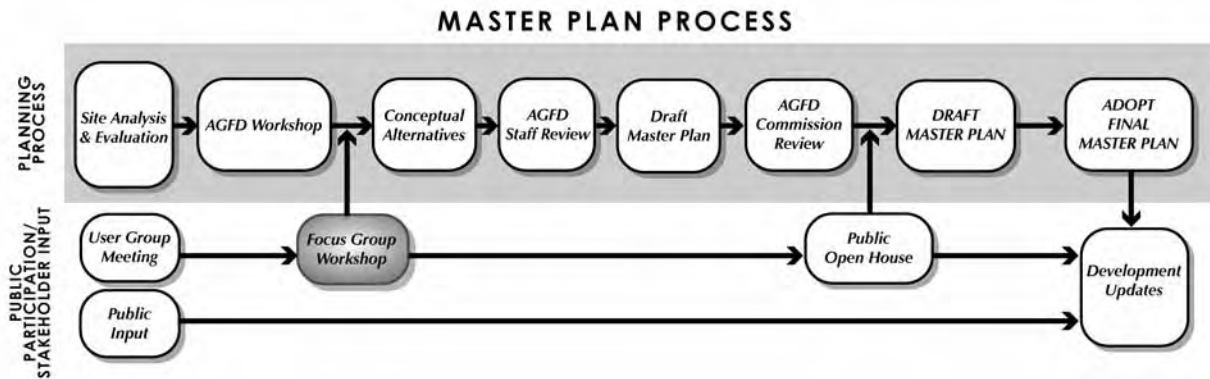
Ben Avery Shooting Facility (BASF) is an approximately 1,650-acre facility owned and operated by the Commission of the Arizona Game and Fish Department (AGFD) under authority of Arizona Revised Statutes (A.R.S.) Title 17. BASF is one of the largest publicly owned shooting facilities in the United States and is located at the northwest corner of Interstate 17 and Carefree Highway, approximately 30 miles north of downtown Phoenix (Figure 1, *Regional Context*).

BASF was developed from the late 1950s throughout the late 1960s on lands leased from Arizona State Land Department (ASLD) to the Arizona Game and Fish Commission and sub-leased to Maricopa County using funds shared between the Commission and County. It was originally operated by the Maricopa County Parks Department through the lease agreement with AGFD, and opened in 1960 under the name of Black Canyon Shooting Range. In 1968, the Arizona State Senate passed Senate Bill 186, which authorized an expenditure of Commission funds to purchase the Black Canyon Shooting Range property from ASLD for its appraised value; with the purpose of building a facility to host the 1970 International Shooting Sport Federation (ISSF) World Championship Shooting Competition. The Commission acquired the three land patents, it had previously leased from ASLD in 1972 and added two land patents from the Bureau of Land Management (BLM) acquired in 1963 and 1998. The facility was renamed in 1992 to honor Ben Avery, a longtime champion of shooting sports in Arizona, and one of the key figures in the founding of the facility. AGFD took over operations of the facility from Maricopa County in 1995. That same year, BASF was also named a City of Phoenix "Point of Pride", and has since been named a "Five Star Facility" by the National Association of Shooting Ranges. Current facilities at BASF include: a multitude of ranges serving a variety of firearm users and firearm types, competitive and recreational archery facilities, a campground, and classrooms for facility users. The headquarters for AGFD is located on the southwest corner of the BASF site, on Carefree Highway.

BASF is located in a natural Sonoran Desert setting, near the rapidly expanding Phoenix metropolitan area. As growth continues, the need for a variety of recreational opportunities will increase. BASF provides a unique form of recreation easily accessible to shooters from throughout the Phoenix area. The facility continues to host world-class shooting events with participants from around the United States as well as other countries. In addition to recreational shooting and competitive events, BASF provides a training facility for use by military and law enforcement agencies, and offers gun safety and hunter-education courses. Well-informed and well-educated participants in the shooting sports are vital to maintaining good relationships with BASF's neighbors and the non-shooting public.

### 1.2 Planning Process Overview

As detailed in Figure 2, *Master Plan Process*, the planning process for the BASF Master Plan consisted of eight stages, with each stage including input and/or feedback from agencies, users groups and the general public, resulting in a guide for the continued development of BASF as a high-quality shooting facility.



**Figure 2. Master Plan Process**

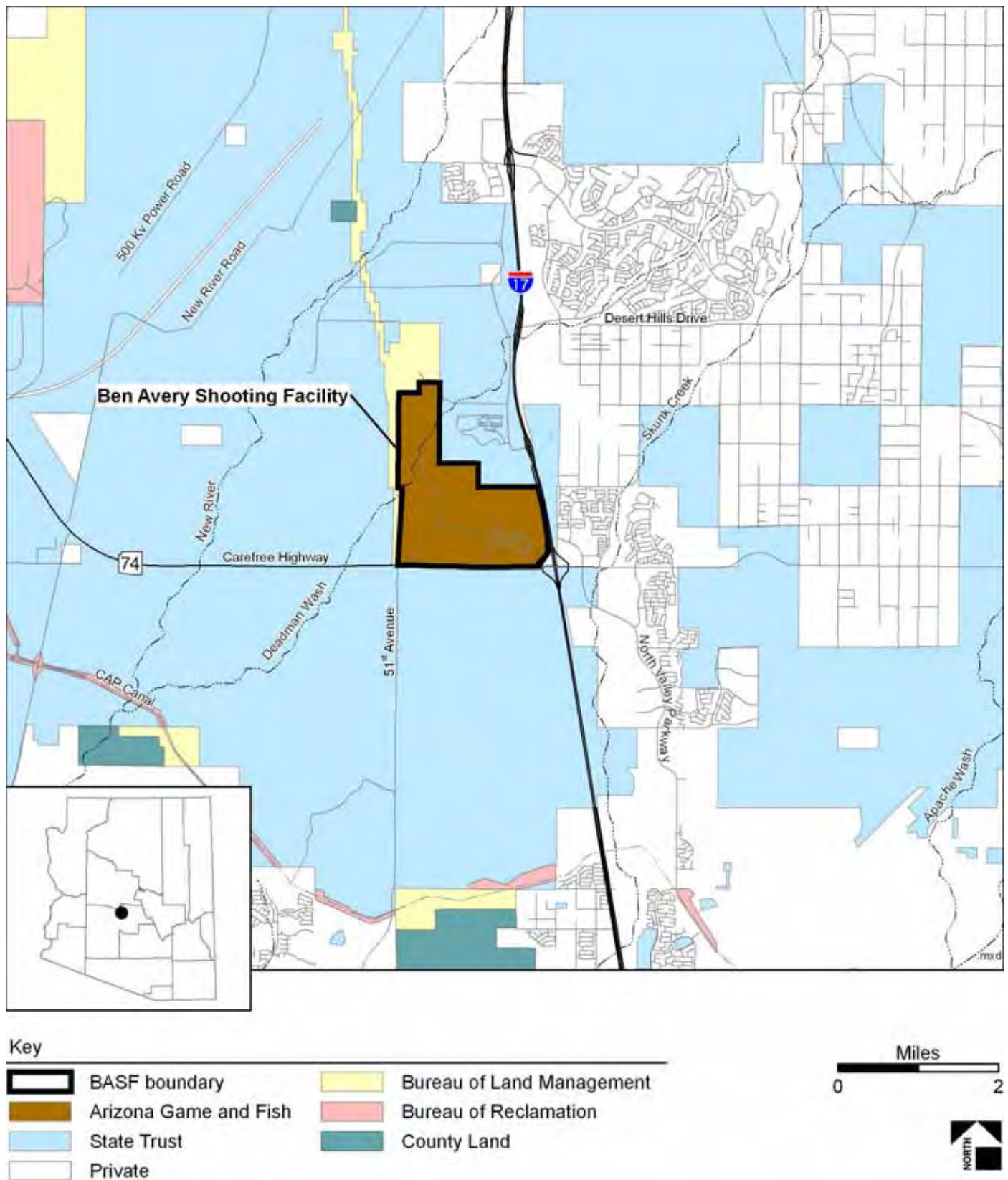
In a broader context, however, this current planning effort represents the beginning of a dynamic planning process to identify and establish both short term and long term development objectives. While this Master Plan is intended to guide development over an extended period, it does not offer a timeline or budget allocations and will be regularly updated every five years. As detailed designs for specific areas of the facility are prepared, user groups and shooting enthusiasts will continue to be consulted in order to assure that it meets the needs of AGFD and shooting sport enthusiasts as values, issues, needs and trends shift over time.

Current and future values, issues, and needs related to the existing and proposed development of the BASF Master Plan were identified by AGFD staff as well as shooting facility user groups. The user groups were given the opportunity to identify values, issues, and needs at the User Group Workshop, and through communications with AGFD staff. Based on this input and the comments received at the User Group Workshop and Focus Group Meeting; a Vision Statement and Goals and Objectives were developed. These became the basis for facility programming and development of conceptual alternatives in the BASF Master Plan.

Public participation program is one of the key components of a successful master plan, as it is only with community support that the goals and objectives are met and implementation of the plan is successful. Because of BASF's specialized nature, public participation for the Master Plan was focused primarily on the user groups regularly engaged in range events and activities.

Alternatives were developed based on site inventory, site analysis and input received at agency, user group and focus group meetings. Concepts considered the opportunities and constraints of the site's natural, physical, and scenic resources; and conformed to the vision, goals, and objectives for the Master Plan. A Draft Master Plan was developed that included a synthesis of the various alternatives based on staff reviews. The Draft Master Plan was presented at a final Public Open House Meeting, providing user groups, stakeholders, general public and AGFD staff an opportunity to review.

The Final Master Plan was then developed, based on the comments received from user groups and AGFD staff on the Draft Master Plan. The Final Master Plan represents a synthesis of tasks completed during the course of the master planning process and provides a tool for the long-term development of facilities and services to ensure a safe and high-quality recreational experience for which BASF is known, while preserving the natural desert character of the site.



**Figure 1. Regional Context**

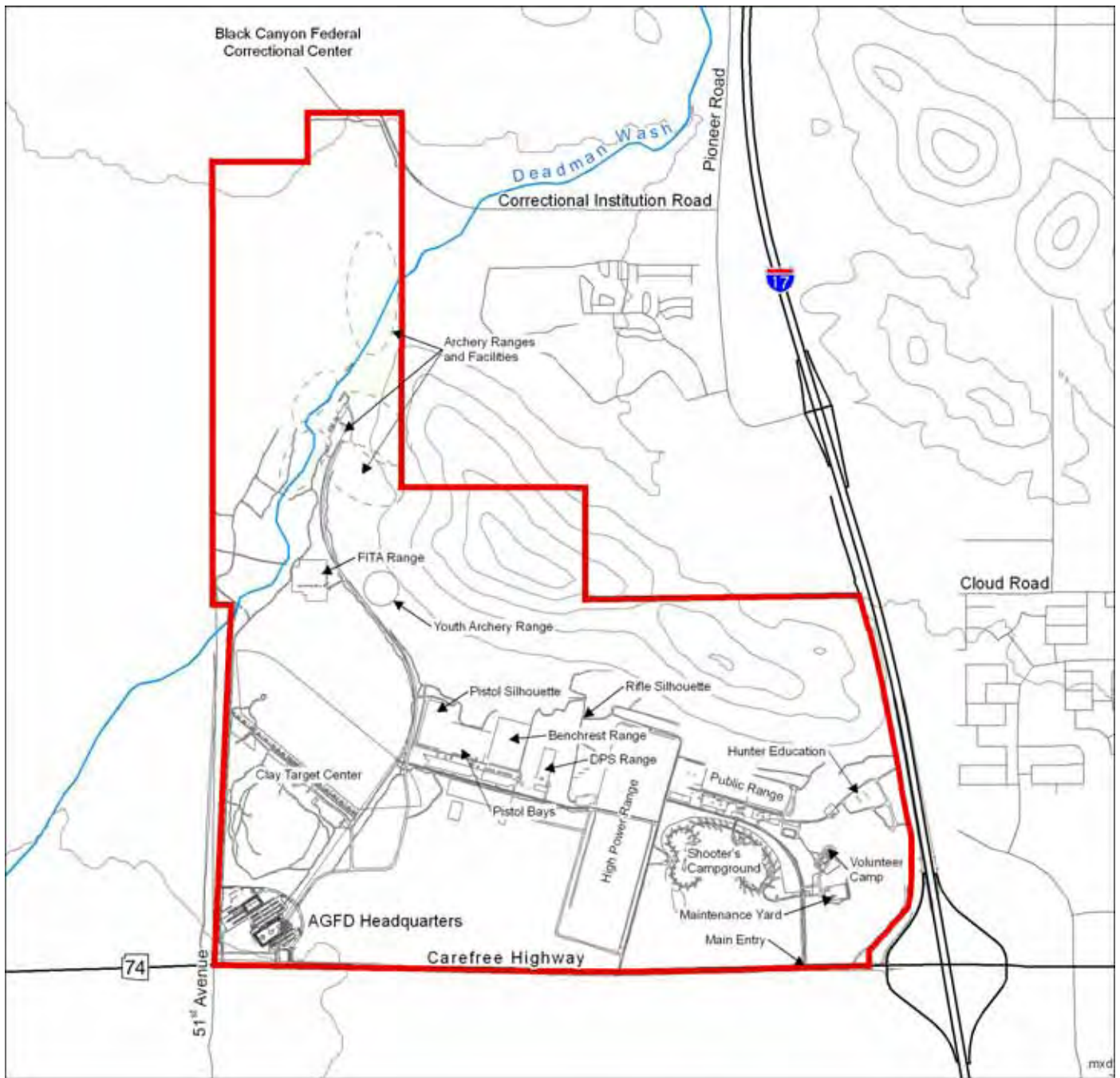
## 2.0 SITE INVENTORY AND ANALYSIS

### 2.1 Introduction and Methodology

The BASF Master Plan inventory and analysis includes the documentation of existing adjacent infrastructure and facilities; existing and planned adjacent land uses; and biological, visual, and environmental considerations. The purpose of the inventory and analysis is to identify and describe the physical and functional relationship of BASF's resources to the opportunities and constraints that apply based on the existing data. See Figure 3, *Existing Facilities* for reference to specific range and facility locations.

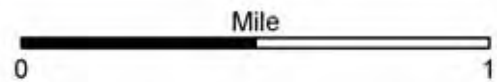
### 2.2 Site Reconnaissance

Site reconnaissance was conducted to provide general information on the physical and natural features of the site and to identify potential opportunities and constraints for the development of the Master Plan components. The site review covered a variety of elements including biological resources, infrastructure, and existing structures and facilities. Detailed resource surveys were not conducted and additional site specific evaluations will be required prior to development of proposed improvements.



Key

BASF boundary



**Figure 3. Existing Facilities**

## 2.3 Biological Resources

The biological resource analysis documents existing general conditions at the BASF site, and gives an assessment of habitat and values and wildlife species likely to occur at the site. In addition, lists of potentially occurring plants, mammals, birds, reptiles, and amphibians were collected from the existing literature using distribution maps and habitat requirements of various Arizona flora and fauna. These lists are included in Appendix A – *Biological Resource Information*. Biologists conducted a ground reconnaissance survey of the site to document existing conditions and record wildlife and plant species inhabiting the area.

BASF is located in the Arizona Upland Sonoran Desertscrub subdivision of the Sonoran Desertscrub biotic community, which is the least desert-like and best-watered desertscrub in North America. Numerous cacti species are present in this subdivision and woody plants are either spiny or contain secondary plant compounds to discourage herbivores (Turner and Brown, 1994). The Arizona Upland Sonoran subdivision includes areas of multi-dissected sloping plains and broken ground (Photo 1, *Example of Arizona Upland Sonoran Desertscrub Subdivision Vegetation near the Archery Range*). The dominant plant in the washes is palo verde (*Cercidium spp.*) and mesquite (*Prosopis spp.*) while creosote (*Larrea tridentata*) is the dominant plant in the upland areas. The majority of the BASF complex sits in a large expansive wash that flows from the northeast to the southwest. Another large (4 feet deep), yet narrow wash bisects the northwest part of the property and flows southwest behind the Archery and International Archery Federation (FITA) Ranges.

North of the main part of the complex are some rocky hills with an approximate elevation of 2,024 – 2,165 feet above mean sea level. These hills are the western terminus of a northwest to southeast running range of low hills.



**Photo 1: Example of Arizona Upland Sonoran Desertscrub Subdivision Vegetation near the Archery Range**

## **Habitat Quality**

Areas within BASF are broken down into habitat values based on the site's existing conditions. Using observations gathered from field reconnaissance and aerial photography showing topography and vegetation, relative habitat values of "high," "medium," and "low" were delineated within BASF (Figure 4, *Biology—Habitat Values*). "High" value habitat was assigned to areas that are structurally complex and/or provide habitat and movement corridors to other areas within the property and outside the property. "Medium" value areas can be either disturbed or undisturbed and provide moderate cover, food, and water. These "medium" value areas may be enhanced by the presence of adjacent high-value habitat. Disturbed areas that have scant cover, food, and water available are rated "low." Most of BASF consists of disturbed Sonoran Desertscrub that is rated "low" due to the level of disturbance from the construction and operation of the shooting facility.

The wash corridor that transects the property near the Archery Range receives a "high" habitat value because of its connectivity to other areas, on and off BASF property; which allows wildlife to move across long distances in the landscape without the threat of human contact. The large wash that the majority of the main complex sits in received a "low" value due to the disturbance (noise associated with human activity) and hindrance (buildings and ranges physically blocking the movement of animals) to wildlife utilizing this corridor. Biscuit Tank, situated north of the Air-gun Range and northwest of the Hunter Education building, received a "high" rating as a source of water for wildlife in the area and the surrounding area also provides good cover with the numerous large trees.

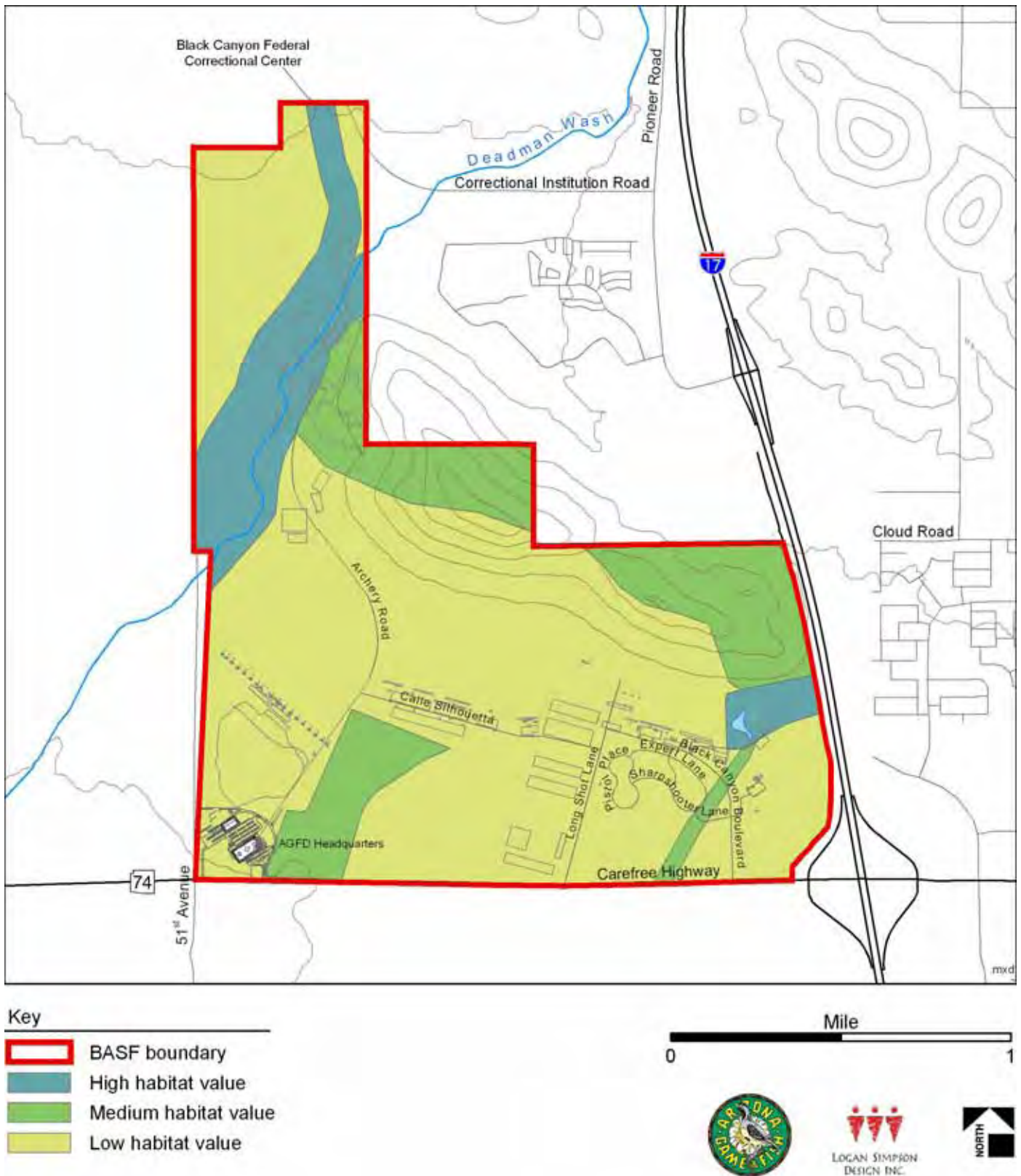
Two smaller wash corridors, within BASF, received a rating of "medium" because the vegetation is less robust than in the larger "high" value washes, however, they are still utilized by wildlife as movement corridors. Areas that have been disturbed and contain little cover, like the various types of ranges and the RV park/campground received a "low" rating.

## **General Description of Wildlife**

Most of the wildlife observed during the reconnaissance survey were birds, which is expected because most birds are active and visible during daylight hours and are the most likely group of vertebrates to be encountered during a brief field survey. Species, such as the black-throated sparrow (*Amphispiza bilineata*), curve-billed thrasher (*Toxostoma curvirostre*), Inca dove (*Columbina inca*), ladder-backed woodpecker (*Picoides scalaris*) and Gambel's quail (*Callipepla gambelii*), were some of the more commonly observed birds throughout the BASF property.

Mammals that are likely to be seen in the project area include: desert cottontails (*Sylvilagus auduboni*), coyotes (*Canis latrans*), javalina (*Tayassu tajacu*), and mule deer (*Odocoileus hemionus*). Several species of bats may forage for nectar and/or other insects throughout the park. Several reptile species, including the Sonoran Desert tortoise, may also use the site. Other wildlife that could potentially occur at BASF, either all or part of the year, are also listed in Appendix A.

A list of threatened, endangered, proposed, candidate, and conservation agreement species for Maricopa County was obtained from the U.S. Fish and Wildlife Service (USFWS) (Table A-1 in Appendix A). The field survey revealed the presence of suitable foraging habitat (agave and columnar cactus) for one threatened species, the lesser-long nosed bat (*Leptonycteris curasoae yerbabuena*).



**Figure 4. Biology – Habitat Values**

## 2.4 Soils and Topography

An evaluation of the soils, slopes, and landforms for the BASF was undertaken to determine erosion risk areas and locations suitable for future development. The soils evaluation involved archival research using available National Resources Conservation Service (NRCS) soil survey reports, the SSURGO database, the NRCS web soil survey, and the official soil series descriptions to identify and qualitatively describe the land use suitability and erosion risk associated with the soils in BASF (Camp, 1986). In addition to land use suitability and erosion risk assessment, the soil evaluation was used to identify distinct landform assemblages and describe their degree of stability and suitability for the location of future facilities. The study was designed to provide an overview of soil conditions and to identify erosion risks for broad areas. It is anticipated that additional, site-specific testing will be required for any construction within the BASF. A more detailed analysis of the soils and landforms is located in Appendix B.

### ***Soils and Landforms***

The soils and landforms analysis identified distinct soil/landform assemblages. BASF consists of three general soil/landform groupings or geomorphic surfaces: hill slopes, stream channels/floodplains, and Pleistocene fan terraces. Each area also has varying degrees of stability and suitability for the location of future park facilities, (refer to Table B-1 – Appendix B).

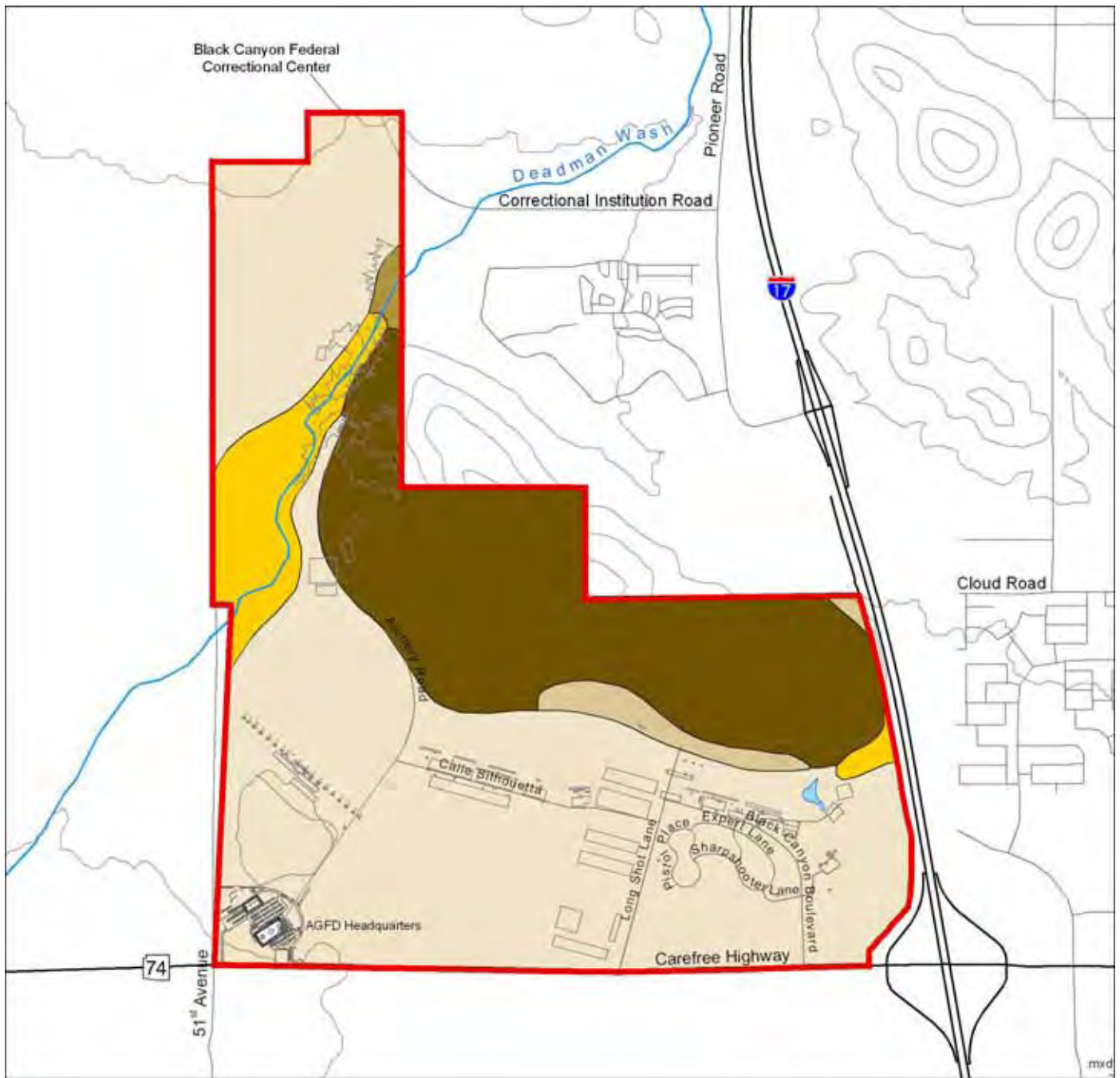
The hill slope geomorphic surfaces in BASF are erosional landforms with thin soil on top of bedrock. These areas are the most susceptible to erosion, and special consideration must be taken to prevent soil loss. There are large areas in the northeastern part of BASF that fall under the hill slope soil/landform grouping. The primary soil in this landform is the Cherioni-Rock Outcrop Complex. (Figure 5, *Soils Analysis*)

The stream channel/floodplain geomorphic surfaces in BASF are associated with Deadman Wash that consists of recently deposited sediment overlying much older Pleistocene fan terrace deposits. These areas are generally stable but are subject to periodic flooding, bank erosion, and wind erosion. The stream channel/floodplain and associated soils, primarily the Tremant gravelly sandy loams, make up only a small portion of the BASF and are located within and along Deadman Wash (Figure 5, *Soils Analysis*).

The Pleistocene fan terrace geomorphic surfaces are stable areas no longer exposed to regular flooding and aggradation and these areas often have relatively impermeable soil layers (argillic clay horizons, duripans). These fan terraces, where the primary soil is the Suncity-Cipriano Complex, cover most of BASF and most of the existing facilities are located on this landform. (Figure 5, *Soils Analysis*) This soil/landform grouping has a high potential for containing shrink swell soils that could adversely affect any buildings or facilities. Shrink swell potential refers to the tendency for some soils high in clay to expand and contract based on moisture content. Buildings or other improvements that are built on highly expansive soils can be damaged over time because of the movement of the soil under and around the facility. Special care should be taken to maintain constant moisture content in the soil. Runoff should be diverted away from buildings in addition landscaping around buildings should be restricted to plants that require little water. The affects of shrink swell soils on buildings and paved roads can be minimized by the use of appropriate engineering design.

### ***Slope Analysis***

The percent slope of an area is the most important factor affecting a soil's susceptibility to erosion. Slope is also a factor in determining the location of future facilities as construction in area with steeper slopes will generally be more expensive. The unnamed rocky hills in the northeastern part of BASF have slope percentages that range from 3% at the lower reaches to >20% slope on the hillsides. The majority of BASF lies southwest of these rocky hills in the low-lying areas where slope percentages are mostly 0-3%, with a few scattered areas of 3-8% slope (Figure 6, *Slope Analysis*). Most of the ranges and other facilities at BASF are in the low-lying flat areas.

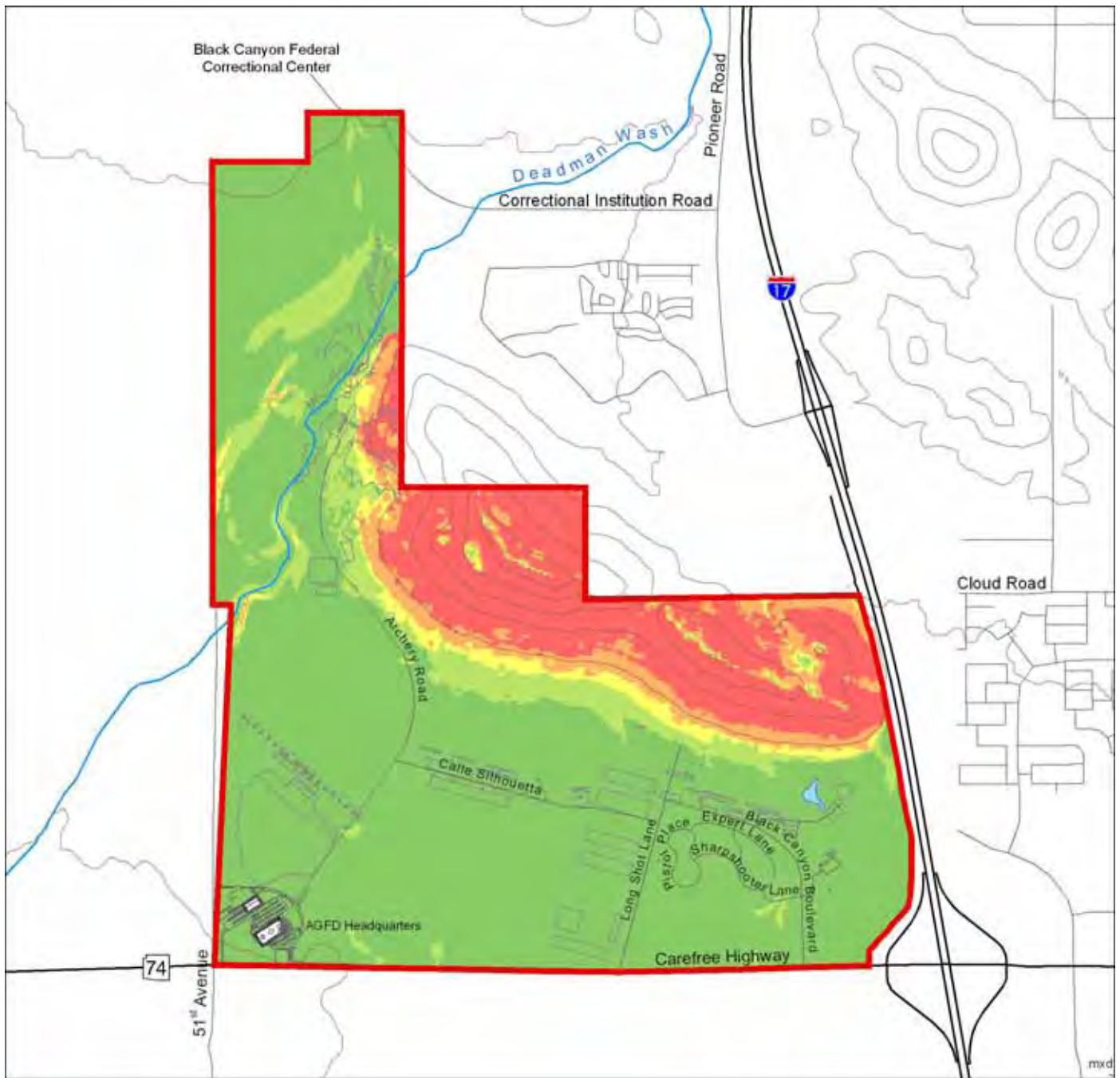


#### Key

- BASF boundary
- Suncity-Cipriano Complex, 1 to 7 percent slopes
- Tremant gravelly sandy loams
- Carefree cobbly clay loam, 1 to 8 percent slopes
- Cherioni-Rock Outcrop Complex, 5 to 60 percent slopes
- Pinamit-Tremant Complex, 1 to 10 percent slopes



**Figure 5. Soils Analysis**



#### Key

<span style="border: 2px solid red; display: inline-block; width: 20px; height: 10px;"></span>	BASF boundary
<span style="display: inline-block; width: 20px; height: 10px; background-color: green;"></span>	0 - 3% slope
<span style="display: inline-block; width: 20px; height: 10px; background-color: lightgreen;"></span>	3 - 8% slope
<span style="display: inline-block; width: 20px; height: 10px; background-color: yellow;"></span>	8 - 12% slope
<span style="display: inline-block; width: 20px; height: 10px; background-color: orange;"></span>	12 - 20% slope
<span style="display: inline-block; width: 20px; height: 10px; background-color: red;"></span>	20+% slope



**Figure 6. Slope Analysis**

## 2.5 Visual Resources

The purpose of the visual resource analysis of the BASF site was to establish the existing visual character of the cultural and physical landscape within and adjacent to the shooting facility. This visual setting can then be considered during the development of a master plan so that the plan can protect and enhance the site's character and aesthetic value. The methodology for this analysis takes into consideration a more developed urban setting of future land use rather than a completely natural landscape.

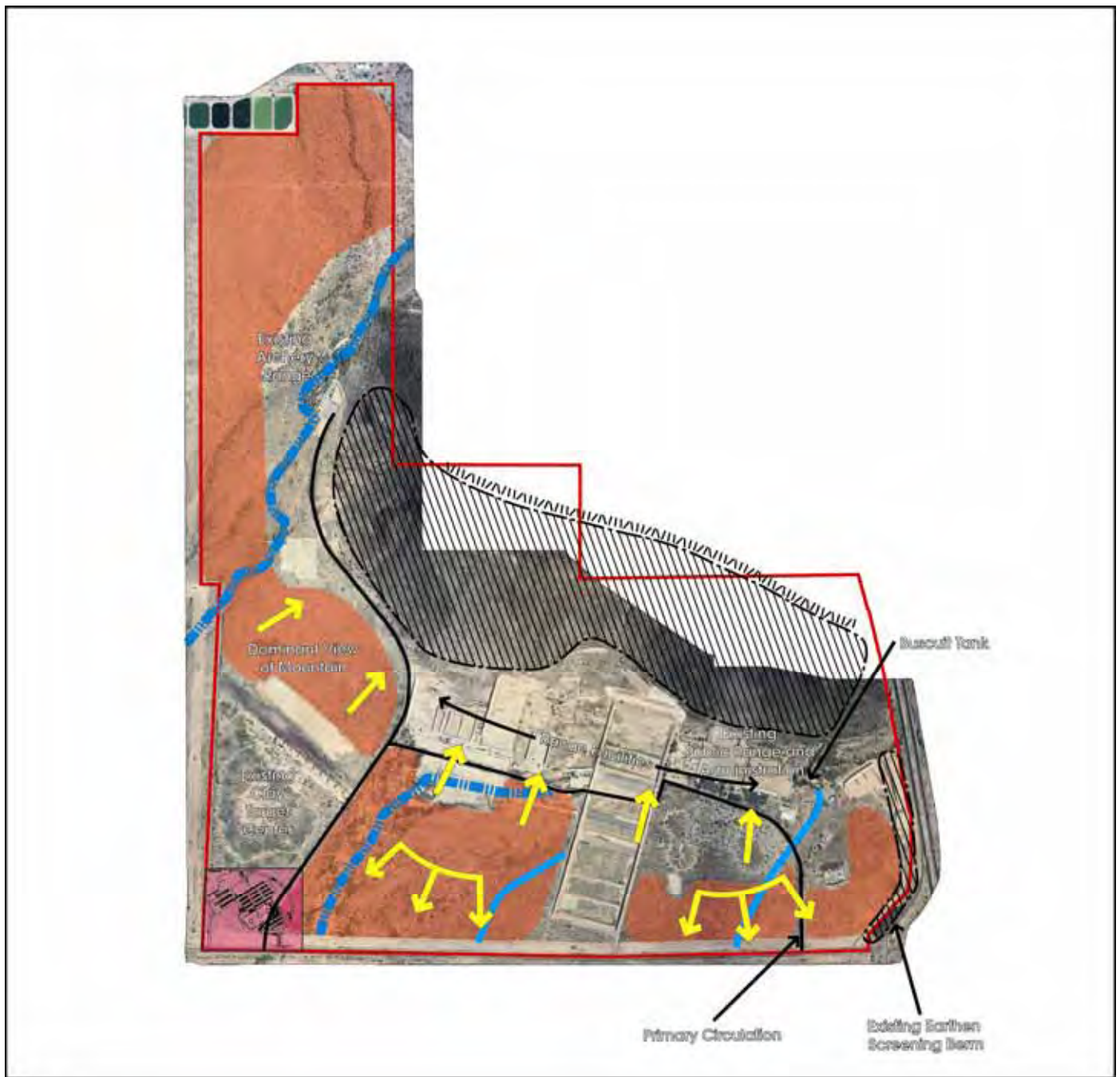
Visual resources of the study area were evaluated in terms of existing visual conditions, view corridors, and landscape character. The visual conditions analysis included an identification of distinct features, notable utility and transportation corridors, areas of preservation and disturbance, key landmarks, and location of major viewpoints. Distinct features are those features comprising landscape elements and patterns that make a memorable visual impression. Viewpoints are described based on publicly accessible locations within the shooting facility. A major viewpoint is one where the distant view of distinct landforms and landmarks attracts attention away from the foreground area. The foreground is defined as the area within about 300 yards of the viewer's position.

The general visual character at BASF is one of low profile development in a predominantly natural desert setting. The hills in the northeast area of the facility are the dominant visual feature from throughout BASF and especially so when using the ranges at the base of the hills. The generally undisturbed feature provides a strong sense of natural open space within the main development area of BASF. The distant views to the south and west are generally open vistas with views to mountain ranges. The shallow slopes and large areas of undisturbed desert create a foreground view that enhances the feeling of natural open space. Future development at BASF, especially on property to the south and west that may only be a few stories high, could be visible from many areas of BASF and substantially alter the views from the facility. Development similar in scale and profile will maintain the natural desert character in foreground views.

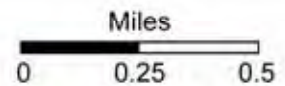
Figure 7, *Visual Resources* depicts the existing visual conditions and identifies distinct features, disturbed areas, terrain and vegetation characteristics, and the general direction of major views. The natural open space setting is a distinctive component of the visual character of BASF that could be preserved and enhanced through sensitive development of future facilities.

## 2.6 Drainage Overview

A drainage study has been prepared for the new AGFD headquarters site at the southwest corner of the BASF site. The study was prepared to identify the drainage requirements, retention needs and other general requirements for the headquarters site. The study did not include an analysis of the drainage requirements of the entire facility but did identify the drainage basins and the general hydrologic conditions of the property. The drainage basins are shown in the AGFD Headquarters Drainage Study located in Appendix C. Specific drainage plans may be required for future facilities, because much of the existing development is located at the base of the major landform to the north and disrupts the natural drainage pattern.



#### Key



**Figure 7. Visual Resources**

## 2.7 Existing Utilities

Existing utility alignments were identified within the BASF for sewer, power, water, and gas available within and adjacent to the site. The location of utility line information, as obtained from existing as-built plans and other documentation, is presented in Figure 8, *Existing Utilities*. A comprehensive Utilities Master Plan will be prepared by AGFD as a compliment to the Final Master Plan and will provide details for all utilities and infrastructure requirements to implement the proposed improvements.

### **Water**

Water service is currently available at the maintenance compound, Shooter's Campground, and all shooting ranges via two onsite wells and a City of Phoenix waterline which supplies the new AGFD headquarters, located along State Route (SR) 74/Carefree Highway.

As future development occurs, a detailed water distribution system analysis should be completed to determine facility improvements necessary to support growth. This could include modeling to verify minimum pressures and adequate capacity in the existing system and potential design and construction of a new distribution system utilizing the new taps at Carefree Highway. It is anticipated that additional facilities such as wells or tanks will not be required for this project, and that existing wells may be abandoned for facility use.

### **Sewer**

The BASF is currently being serviced by septic systems. However, there are two stub-outs on both the east and west portions of the site at Carefree Highway for sanitary sewer service hook ups. This will connect the facility into the City's sewer system. Capacity of this existing line as well as the exact depth and location of the stub-outs will need to be determined prior to connection. It is anticipated that the site will connect into these two existing stub-outs until the capacity of these lines has been fulfilled and the remainder of the site will continue to be serviced by septic systems or combined facilities where practical.

Future growth may warrant the need for a lift station and force main system. A detailed evaluation will need to be performed to locate the lift station and determine the service areas necessary for service.

### **Power**

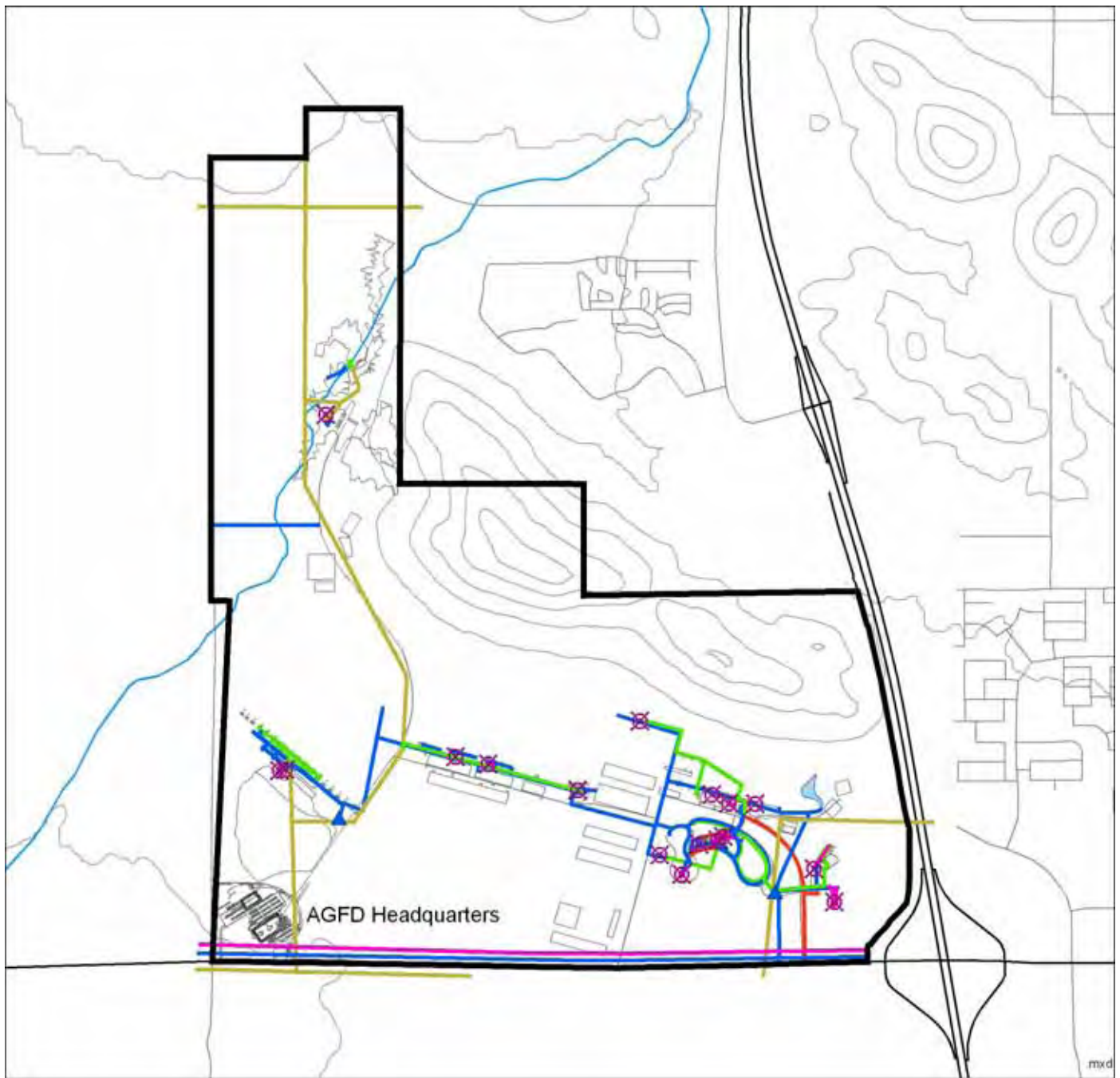
The BASF is currently being serviced by both overhead power lines and underground transmission lines. APS Electric Company is the service provider. There is some existing lighting onsite; however, more lighting may be necessary depending on the range use and development.

### **Gas**

There is an existing gas line located along SR 74/Carefree Highway at the main entrance of the site. It follows Black Canyon Boulevard and terminates at the main range office buildings as shown in the construction documents provided by AGFD. However, Southwest Gas maps do not show any service within this area.

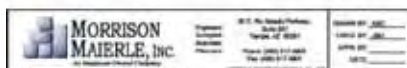
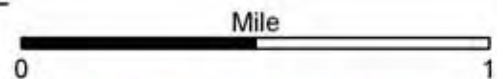
### **Communications**

Telephone is currently available at BASF and can be distributed to new facilities as needed via the overhead power distribution system. Cable service by Cox Communications is also available at the facility, and can be directed as needed.



# Key

- |  |                        |  |                                 |
|--|------------------------|--|---------------------------------|
|  | BASF boundary          |  | Existing Sewer                  |
|  | Existing Septic System |  | Existing Water                  |
|  | Existing Well          |  | Existing Underground Electrical |
|  | Existing Gas           |  | Existing Overhead Electrical    |



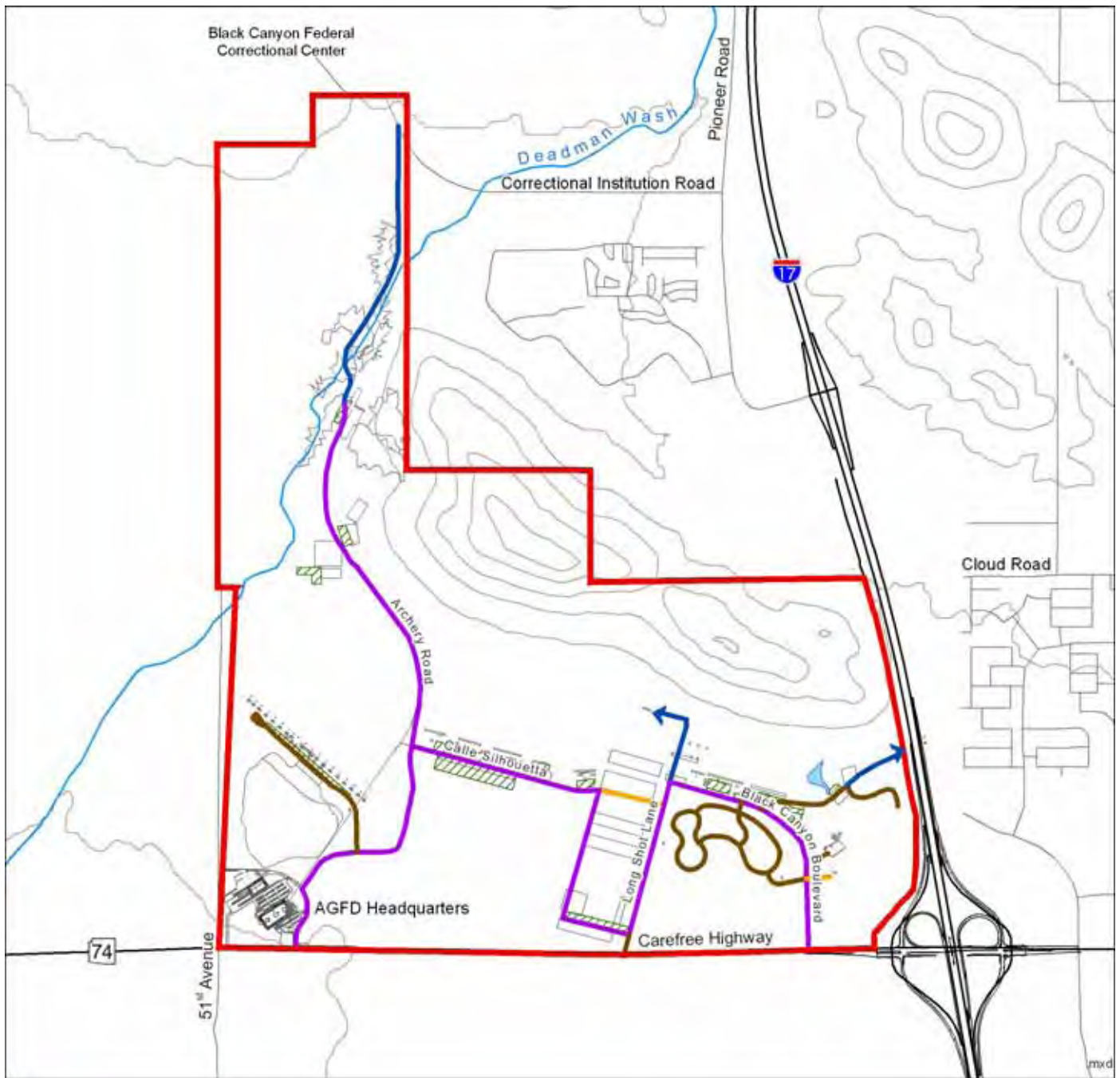
**Figure 8. Existing Utilities**

## 2.8 Roadways and Circulation

There are numerous roads that provide access throughout BASF, as shown on Figure 9, *Roadways and Circulation*. The roads include Black Canyon Boulevard, Long Shot Lane, Calle Silhouetta, and Archery Drive. Most main roadways are chip sealed without a curb or gutter. Most are in fair condition for the current level of use. Detailed analysis of roadway conditions will be required for specific projects to assure adequate service and quality of roadways is achieved for proposed uses.

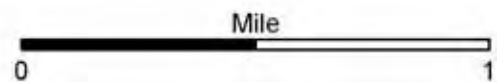
The main entrance to the park is accessed directly off of Carefree Highway. The existing entrance and access road was upgraded in August 2006. The Arizona Department of Transportation (ADOT) has redesigned the Carefree Highway/I-17 traffic interchange and adjustments to the access locations for BASF may be required to meet safety requirements. The current design plans for the new interchange are included on the base mapping for the Master Plan. The new AGFD headquarters site includes a main entry that will be a signalized intersection. This entry will provide a connection to Archery Drive, and can be used to access the western portion of BASF. However, conflicts with headquarters circulation and activities might occur, if the traffic volume becomes too high.

BASF has parking lots onsite and the majority of these lots are unpaved. The parking area near the existing administration building is in good condition and provides adequate access to the main public range and Small Bore Range. Future growth of other range areas will warrant additional parking. Maricopa County regulations will likely require additional parking to be paved to reduce particulate pollution from unpaved parking areas. Overflow parking for large events occurs in several locations including within the High Power Range.



#### Key

- BASF boundary
- Parking
- Main circulation route
- Secondary circulation route
- Service route
- Limited access route



**Figure 9. Roadways and Circulation**

## 2.9 Land Use

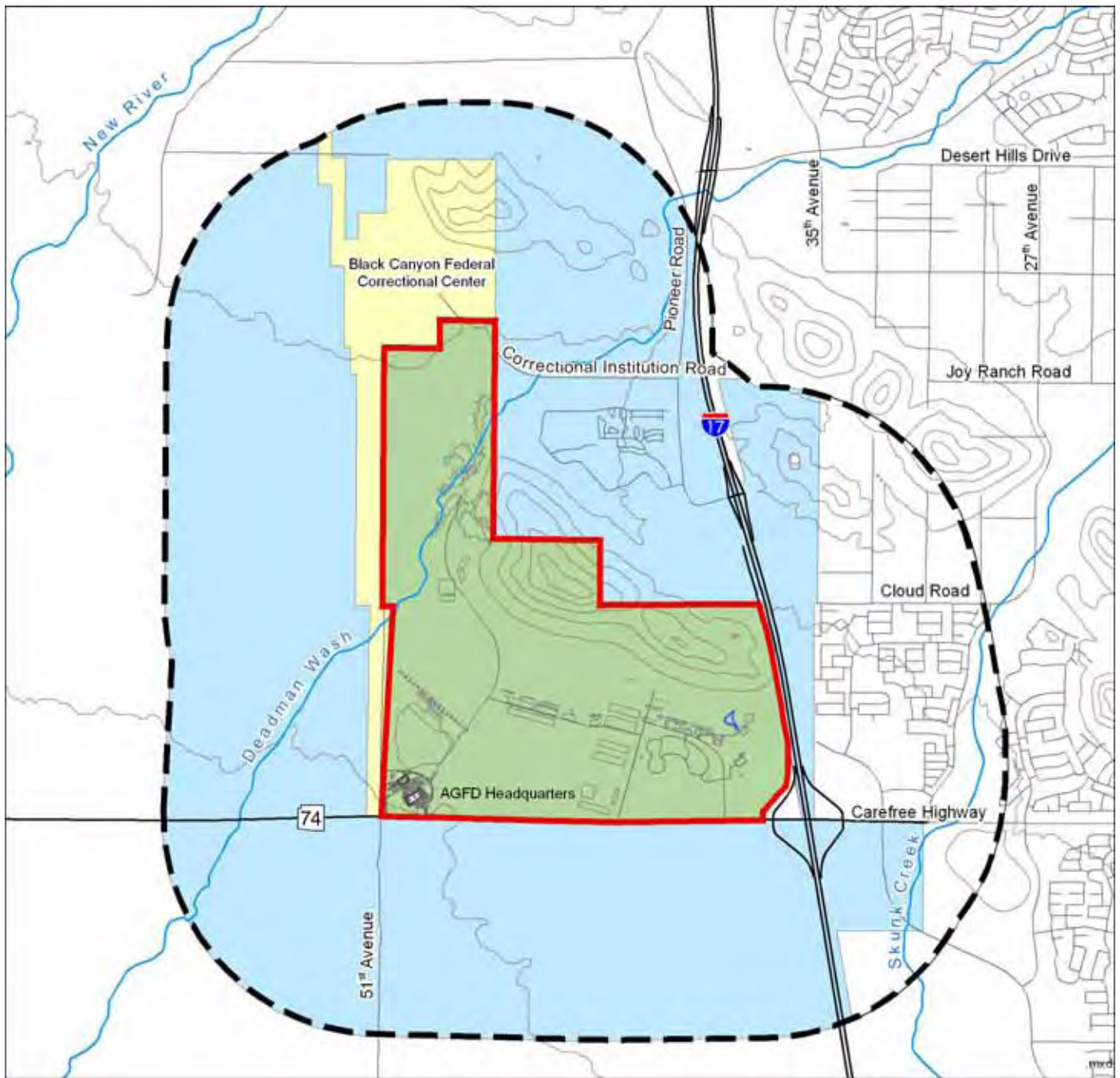
The purpose of the land use overview of the BASF Master Plan is to identify existing and planned land uses within and adjacent to the BASF. A one-mile buffer of land surrounding BASF was reviewed for current and projected land uses. Current land ownership can be seen in Figure 10, *Land Ownership*. Current land use can be seen in Figure 11, *Current and Projected Land Use*.

Inventory methods included a review of existing planning documentation, aerial photography, and a field verification of the adjacent area. Land jurisdiction and ownership, existing land use, and planned land use were identified from available public records.

The current City of Phoenix zoning designation for BASF is S-1 SP, implying a Ranch or Farm Residence District with a special permitted use for the shooting range. Adjacent lands to the north, south, west, and east to I-17 within the City of Phoenix are also zoned S-1. East of I-17, the land is zoned with a variety of low to medium density residential and commercial designations under a Planned Community Development (PCD) overlay. As shown in Figure 10, *Land Ownership*, these adjacent lands are both privately and publicly (State Trust Land and Bureau of Land Management) owned.

Current land use was obtained through aerial photography, Maricopa County Assessor information, field verification, and City of Phoenix data. Projected land use information was obtained from the City of Phoenix and reflects the current General Plan maps. Potential future land use includes parklands, preserves, and open space to the northeast of BASF and also along the wash extending southwest from BASF. Mixed Use, which includes a variety of integrated and/or compatible residential and commercial uses is planned for lands west of BASF, north of Deadman Wash, and south of BASF and Carefree Highway. Based on the type of development permitted in the mixed use areas, it is anticipated that future development plans on surrounding lands would include residential uses of various densities with associated commercial services. A planned residential development of 2-5 units/acre is currently being sited at the southwest corner of the 51st Avenue alignment and Carefree Highway.

An existing master planned development, Tramanto, is located east of BASF across I-17. The development consists of a commercial center along Carefree Highway adjacent to the east side of I-17, and medium-density residential development. A narrow strip of undeveloped Bureau of Land Management (BLM) land is located along the western edge of BASF along the 51st Avenue alignment and extends to the north where the Black Canyon Federal Correctional Center is located. Beyond this strip to the west lies undeveloped State Trust Land. Undeveloped State Trust Land also abuts the southern edges of BASF from Carefree Highway south to Happy Valley Road. This land is currently under high pressure to develop in a manner similar to adjacent areas. The Pioneer Arizona Living History Museum and Pioneer Village Trailer Park are located to the northeast of the facility. Projected Land Use can be seen in Figure 11, *Current and Projected Land Use*.



#### Key

- BASF boundary
- 1-mile buffer
- Private
- State Trust
- Bureau of Land Management
- Arizona Game and Fish Department

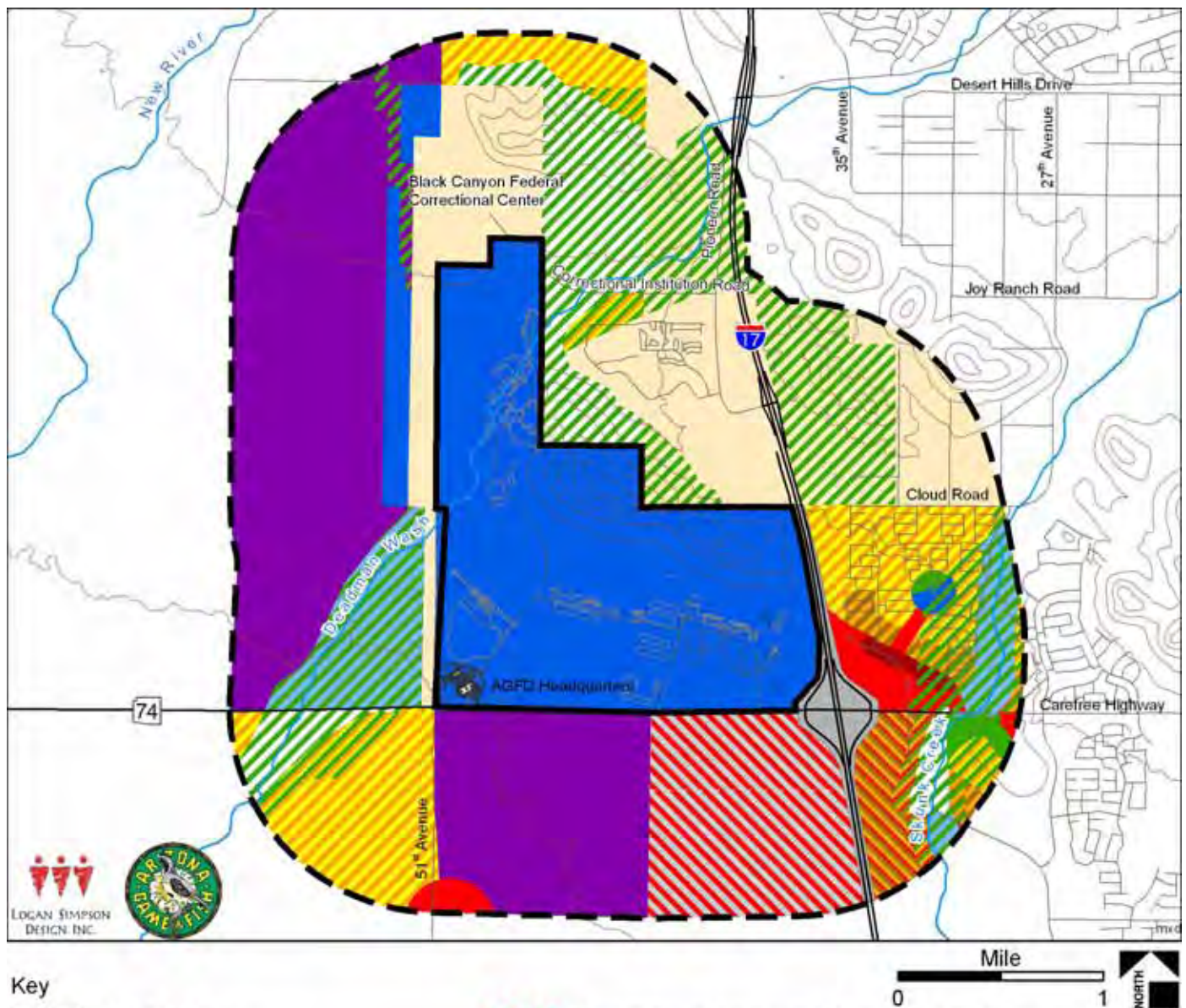
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LOGAN SIMPSON  
DESIGN INC.



**Figure 10. Land Ownership**



### Key

	1-mile buffer		Mixed Use (Commercial/Commercial Park)
	BASF boundary		Mixed Use (North Gateway and Northwest Area only)
	2 to 5 dwelling units (du)/acre		Mixed Use (Commercial/5-10 du/acre/10-15 du/acre)
	5 to 15 du/acre		Preserves/2-3.5 or 3.5-5 du/acre
	15+ du/acre		Preserves/5-10 or 10-15 du/acre
	Parks/Open Space - Publicly Owned		Preserves/15+ du/acre
	Parks/Open Space - Future 1 du		Preserves/Commercial
	Commercial		Preserves/Public/Quasi-Public
	Public/Quasi-Public		Preserves/Floodplain
	Transportation		Preserves/Mixed Use/Commercial/5-10 or 10-125 du/acre
	Undesignated Area		Preserves/Mixed Use (Area C and D only)
	Mixed Use		Preserves/Undesignated

**Figure 11. Current and Projected Land Use**

## 2.10 Architectural/Existing Structures

There are numerous existing buildings, shade covers and storage facilities at BASF. An overview of the structures was performed for the BASF Master Plan and an initial evaluation list of the facilities is in Appendix D, *Existing Structures/Facilities Evaluation List*. The structure overview assessed the general condition and functionality of the structures and did not include a detailed analysis of the structural condition or an assessment of plumbing, electrical or mechanical systems.

Most structures at BASF are in good condition and serviceable for the intended uses. The exceptions are the storage facilities located at many of the ranges. Many are in fair to poor condition and in need of replacement or rehabilitation. Classroom/restroom buildings appear to be in good condition overall, but may be in need of updated fixtures, hardware or other equipment to enhance their serviceability. Shade canopies for the firing lines and general use are in good condition overall. Several canopies in the Granite Acres Campground, used for BASF volunteers, are in poor condition and need to be replaced.

An initial assessment of ADA accessibility is identified in Appendix D. Future projects and improvements will include a detailed assessment of ADA accessibility as part of the design and planning.

## 2.11 Hazardous Materials

A hazardous materials investigation was not performed for the BASF Master Plan. AGFD maintains a record of hazardous material incidences and has best management practices (BMP) in place for handling and reporting hazardous materials activities. AGFD also follows current BMPs for testing and recovery of lead throughout BASF. The BASF Lead BMP Plan is included in Appendix E, *Hazardous Materials/Lead Management*.

## 2.12 Cultural Resources

Cultural resource surveys or literature reviews were not completed for the BASF Master Plan. Recent surveys performed for the AFGD headquarters facility indicate the presence of both historic and prehistoric archaeological sites (Courtright, 2006). Generally, the prehistoric sites found in or near the project area consist of lithic scatters, rock clusters and alignments, and a lithic quarry. Historic sites consist of trash or debris scatters.

## 2.13 Site Analysis Summary

The site inventory and analysis will help ensure that the BASF Master Plan can be developed in such a way as to maintain the existing character and resources of the site. Planning that considers the sites resources should also help the facility to be developed and managed in a way that provides a positive image of community and environmental stewardship, long-range foresight, sustainable planning, and economic accountability.

The site analysis and field reconnaissance indicate the BASF has few limiting constraints and challenges associated with future development and expansion of programs at the facility. Further in-depth surveys and site-specific analyses will need to occur to provide necessary information for the detailed designs of future site amenities and facilities. The following is a general summary of the resources and potential future study needs found during the site analysis that served to guide development of the BASF Master Plan.

- The large areas of open space and good habitat likely sustain a wide variety of wildlife common to the Sonoran Desert and no sensitive species are known to be present. Planning development to maintain natural, open space and preserve wildlife corridors will help sustain the wildlife at BASF.
- There are no significant limitations in the soils and landforms on the site except the very steep slopes of the hills in the northeastern area. Some areas of soils with shrink swell potential may exist in the shallow slope areas and site soils analysis will identify limitations and mitigation.
- Planning and development that is similar in scale and profile to existing development will help maintain the unique feel of the natural desert within the more urbanized landscape that will

surround BASF in the future. Planning should also be conscientious of views on and off-site. Maintain screens and buffer areas between adjacent land uses to the extent possible.

- The existing utilities provide the level of service needed for existing development but a will need to be upgraded to accommodate future development. A detailed Utilities Master Plan will be prepared by AGFD to compliment the BASF Master Plan to assure the implementation of the plan can occur with the required infrastructure support.
- The existing roadways a generally adequate for current levels of use but will need to be upgraded to support increased traffic for future development. New roadway development that is similar to the existing asphalt paving with no curbs or gutters will help maintain the informal, open space feel of the road system.
- The parking areas for some of the ranges may need to be upgraded to accommodate higher levels of use and to meet Maricopa County air quality regulations. Improvements will likely include: paving, striping and lighting.
- Most existing structures, including buildings and range canopies are generally in good condition and should be retained and incorporated into implementation plans for future development.
- Cultural resources are known to exist at BASF and future surveys will be required to determine if they are present at locations proposed for new improvements.
- All new development and enhancement of existing facilities should include planning for ADA accessibility.

## 3.0 AGENCY INPUT

### 3.1. Introduction

Through coordination efforts with AGFD, a workshop was organized to gather information on the project and overall BASF functions from AGFD staff. Information on daily operations, current management practices, staff perceptions and future plans for the facility were included. In addition to providing information, the staff workshop helped establish proper lines of communication with AGFD personnel and provided a framework for future internal staff/consultant meetings. Information gathered from the workshop was used to align both AGFD staff and BASF user group desires to more appropriately plan for the BASF Master Plan. A detailed version of notes from this workshop can be found in Appendix F, *Agency Involvement*.

### 3.2 Agency Workshop

The purpose of the workshop was to determine the values, issues, needs, and programming elements identified by AGFD staff for the BASF Master Plan. An overview of the master-planning process and timeline was discussed. The workshop identified values the AGFD staff wished to preserve, issues the master planning effort should address, and overall needs that the Master Plan should incorporate to ensure successful implementation. The staff also spent time discussing potential opportunities and constraints that need to be considered in implementing a master plan as well as the general programming of the overall facility. A summary of the discussions is below and more detailed information on the results of the workshop can be found in Appendix F.

#### **Values**

*Values* are described as the elements that make the facility a special and unique place—the elements that the facility feels strongly about retaining. Many of the values discussed by participants pertained to programming at BASF. Participants were excited about the current and potential diversity of user groups, including various law enforcement and military agencies. Staff placed a high level of importance on maintaining this distinction for BASF among its shooting facility peers. An overall perception that the facility should remain as an oasis of natural, Sonoran Desert beauty in an increasingly urbanized environment was echoed with desires to maintain perceptions of BASF as a permanent, publicly-supported, family-oriented, education-based feature of the community. Participants discussed comparisons to similar shooting facilities nation-wide and felt emphasis should be placed on the continued diversification of outdoor experiences, including many shooting sports, hunting, birding, fishing, hiking/camping and off-highway vehicle use. This diversification of experiences should be coupled with a positive family-oriented, multi-age atmosphere offering a sense of public ownership and stewardship to both the shooting range as well as to the community in which it is located.

#### **Issues**

*Issues* are described as the elements of the shooting facility that need to be changed or improved. For organization purposes, issues identified at the workshop were divided into the two subsections below.

##### *Use, Staffing, and Scheduling Issues*

Participants felt that conflicts between user groups attempting to use the same range facilities, long lines at shooting ranges and traffic congestion on Carefree Highway at the main entry needed to be changed or improved. Other similar issues included: conflicts between concurrent trap and skeet events, some ranges not being used to their full potential or understaffed (in terms of scheduling and hours of operation), an inadequate range reservation process and conflicts between general public shooters and established user groups.

##### *Infrastructure Issues*

A lack of ADA-accessible facilities in some areas of BASF was considered an important issue that needed to be addressed. Substandard signage and minimal way finding elements were noted as causes for traffic confusion and decreased user satisfaction. Inadequate classroom and activity space, limited

restroom availability and aging buildings were cited as structure-related issues. Workshop participants emphasized the limited numbers of RV parking/camping sites, minimal daily and special event parking areas and a lack of range security as infrastructure issues related to hosting large events and tournaments. Drainage problems, inadequate lighting and poor separation of ranges were also mentioned. Large-scale infrastructure issues included: a limited and aging potable water distribution system, a lack of adequate fire protection measures and ineffective land use planning throughout the facility.

### ***Needs***

Needs are described as the building blocks for a successful master plan. By identifying potential needs, a master plan can assist in the development of programs, procedures, and structures that anticipate and provide space and opportunity for future growth trends. Needs identified during the AGFD staff workshop were organized into four subsections below.

#### ***Facility Needs***

Participants suggested a number of general facility and infrastructure needs for improving the overall appearance, function and experience of BASF. Among those suggested as infrastructure based needs included, new sewer lines, new range lighting, permanent equipment storage, improved security measures, alternative power sources, better maintenance of roadways and increased paved parking areas. RV camp sites, RV storage and dump stations, improved public camping and expanded shade structures at shooting lines were also noted. Non-shooter related needs included: first-aid stations, retail opportunities and large spaces for events/gatherings. Some participants felt that BASF lacked a unifying aesthetic theme and suggested that landscape improvements, existing building rehabilitations and new structures need to be developed so as present an improved, overall facility appearance.

#### ***Range Needs***

AGFD staff suggested that the enhancement of the shooting experience was needed to diversify existing and attract new shooters to the facility. Additional Trap and Skeet lines, new Sporting Clays courses, multi-use ranges with varying shooting positions and target types, a new indoor range and the restoration of the indoor Air-gun Range, were all discussed as shooting range needs deemed important to the success of BASF. Target improvements, expanded corrals and arenas at the mounted shooter's area, a new Sporting Clays course tower and the addition of a paintball range were included as optional needs.

#### ***Education and Outreach Needs***

Participants identified the education and community outreach component of BASF as important to preserve and expand. Improved classroom space, increased advertising efforts and better use of technologies as tools for learning and public outreach, were discussed as ways to provide a better public image of the facility and shooting sports in general.

#### ***Access and Transportation Needs***

Participants suggested the addition of better informational and directional signage at entry points and throughout the facility to improve circulation for cars, RVs, pedestrians and rental carts. The main entry points need to be improved and possibly relocated to accommodate increased traffic volumes and congestion along Carefree Highway.

### ***Opportunities and Constraints***

Opportunities are the factors that increase the potential for successful implementation of the Master Plan, while constraints are those factors that would hinder successful implementation. With proper planning, constraints can often be recast as potential opportunities within the Master Plan. Opportunities identified in the workshop suggested maintaining close relationships with law enforcement agencies and user groups in order to preserve and enhance the credibility of BASF in the eyes of law makers and the general public. Revenue-based opportunities deemed important included: the continued harvesting and recycling of lead and the enhancement of funding sources such as user fees, workshops, shooting lessons, range/building rentals and matching grant monies. Constraints were most directly related to limited hours of operation, physical limitations on space and existing structures, hazardous materials management and adjacent land use conflicts as development continues to occur.

### ***Facility Programming***

Programs are described as the functions BASF should implement to make the Master Plan a success. They were also described as trends for which the facility should anticipate and plan. Participants of the AGFD Workshop identified those shooting sports with greatest anticipated growth. In addition to supporting and planning for these growing user groups, workshop participants agreed that pursuing revenue-generating sport activities (such as clay-target shooting) should go hand in hand with support of activities that enhance credibility with the shooting public such as hunter education, Olympic events, and youth programs. Specific programs identified for improvement were the reservation system, customer service, service to disabled user groups, and the welcoming of non-club members or the general public to BASF.

## 4.0 PUBLIC PARTICIPATION

### 4.1 Introduction

Providing opportunities for the shooting community and AGFD as a whole to actively participate in the master-planning process of BASF was important to the development of the BASF Master Plan. A User Groups Workshop and a Focus Group Meeting were held to identify the community's diverse interests, issues, and needs to provide a common vision and comprehensive foundation for the development of the Master Plan. Additionally, a Public Open-House Meeting was held on October 6, 2007, to display and take comments on the Draft Master Plan.

The following is a summary of the User Groups Workshop and Focus Group Meeting that provided the basis for the site's programming and the development of the Vision, Goals and Objectives and Master Plan. Also included is a summary of the input received at the Public Open-House Meeting. More detailed information from all the meetings can be found in Appendix G, *Public Involvement*.

### 4.2 User Groups Workshop

The User Groups Workshop was held for facility users. The meeting was intended to provide information on the project and to receive user groups' feedback on the values, issues, and needs within the facility.

A meeting notice was sent out by AGFD to members of its active and inactive user groups mailing list. The meeting mailing list included approximately 320 individuals and user groups of the BASF community, from competitive shooting groups to public safety officers, commercial groups, archers, and general range users.

Exhibits presented at the workshop included the study area, existing facilities, existing site features and amenities, and the existing site boundary.

A comment sheet was distributed to everyone in attendance. The comment sheet asked participants to include general comments about the BASF facility. A handout was also distributed to each person who attended the meeting; this handout contained information on the study area, history of the facility, facility description, purpose, and objectives of the BASF Master Plan.

A group discussion was held relevant to values, issues, and needs for future development of the facility. First, a values discussion was held in which participants were asked what they value most about BASF, and what they would like to remain the same if they moved away and came back five years from now. Likewise an issues discussion highlighted the main issues surrounding the use of the BASF by various user groups, and lastly a needs discussion followed in which input was solicited about the current and future needs the various user groups felt were important to maintain and develop the BASF for current and future generations. The following is a summary of the values, issues, and needs discussions from the user groups workshop. For a more detailed list of the values, issues and needs identified at the meeting see Appendix G.

#### **Values**

The values discussion was held in an open group format that provided an opportunity for all participants to speak and listen to each other about what the most important values of the BASF were. The meeting provided opportunities for individuals and groups to express and share their ideas, and through the course of the discussion several different values emerged.

The user groups valued the general recreational opportunities that the BASF offers, because it is family oriented, accommodates special user groups, and offers a diversity of shooting ranges. The user groups also noted that the natural Sonoran Desert setting provides opportunities for wildlife viewing and other outdoor recreation activities. The user groups valued the BASF for its educational functions because they noted that the BASF provides public safety through safe shooter education programs, youth training workshops, and provides areas where public safety officers can train. An additional emphasis was placed on the collective knowledge that the volunteers and user groups have within their specialized shooting fields. This collective knowledge is concentrated at BASF, and is a unique opportunity for shooting sport enthusiasts of all ages and skill levels to benefit from. The user groups also identified the BASF as a

local economic driver, because it currently hosts local and national shooting events such as the AGFD Annual Exposition, Single Action Shooting Society (SASS) Winter Range, Territorial Roundup and the Ben Avery Clay Target Center's (BACTC) registered shooting events. These various local and national events provide an economic benefit to the BASF, and the local economy in general. Additionally, the user groups identified the BASF as a world-class facility that has year-round use, a convenient location to a major international airport and metropolitan area, and can easily facilitate large events. The user groups emphasized that the BASF is a local point of pride that has shooter-friendly staff, a positive public perception, and has an important heritage as the host of the 1970 ISSF World Shooting Championships.

### ***Issues***

The issues discussion was also held in an open group format that provided an opportunity for all participants to speak and listen to each other about what the most important issues surrounding the BASF were. The meeting provided opportunities for individuals and groups to express and share their ideas.

The user groups identified several common issues that frequently arise. First, concerns surrounding staffing and scheduling of events were identified. These issues comprised of an insufficient flexibility of usage in specific areas. Additionally, scheduling conflicts between user groups frequently arise, as well as inadequate staffing for competitions and events. Secondly, common issues surrounding the infrastructure of the facilities were identified. These issues included inadequate and improper storage facilities for equipment, props, and targets; lack of communal facilities and supplies such as a restaurant, pro shop, restrooms and vending opportunities; poor maintenance of roads, ranges and targets; inadequate parking and staging facilities for both automobiles and recreational vehicles (RV's); and access and circulation issues. Lastly, some general issues surrounding education were also identified such as a lack of publicity in terms of shooter safety classes and programs available to the general public as well as general issues of surrounding range rules and operating procedures.

### ***Needs***

The needs discussion was also held in an open group format that provided an opportunity for all participants to speak and listen to each other about the most important needs surrounding the BASF. The user groups were directed to focus on identifying general needs of the BASF facility and informed that a later Focus Group Workshop would be the appropriate place for specific range improvements. The meeting provided opportunities for individuals and groups to express and share their ideas about overall needs, and how future improvements to the facility would benefit individual ranges. The following is synopsis of the needs discussion:

The user groups identified several overarching needs from a general facilities perspective, and these needs generally corresponded to addressing the issues identified above. First, needs surrounding the scheduling of events were identified. The user groups suggested that keeping the BASF open seven days a week, lighting the facility for night use, and extending the hours of use would help alleviate some of the scheduling issues by increasing the amount of time available to users. Secondly, general facility needs were addressed. The user groups suggested needs for larger and more secure storage areas, better event staging areas, comfortable shaded areas to accommodate both shooters and non-shooters, and increased quality and quantity of RV, and camping facilities. Additionally, user groups identified the need for better maintenance facilities, administrative buildings with special areas for staff and volunteers, and an indoor shooting facility. Other facility needs identified were fire suppression equipment and land buffers to help mitigate wildfire emergencies and noise concerns. General range needs identified comprised of general infrastructure issues such as supplying power, telecommunications, and water to all ranges; providing target houses and storage at individual ranges, and lighting where appropriate. Other needs identified were the addition of new ranges and towers at the BACTC. The user groups also identified access and transportation needs, and noted the need for ADA accessibility to all ranges as well as carts to transport people within and between ranges. Lastly, the user groups identified needs associated with educational purposes. The need for a centralized education facility that could incorporate multiple simultaneous training classes and multi-media presentations was identified as well as the need to capitalize on the knowledge and experience of users of the facility by providing areas to host workshops, training seminars and colloquiums. Additional needs identified included: more and better publicity,

identifying new funding strategies and mechanisms, organization of volunteer groups, and the preservation of existing partnerships between private entities, organizations, and agencies.

### 4.3 Focus Groups Meeting

The Focus Group Meeting was composed of user group representatives that were identified by AGFD. The meeting was intended to provide up-to-date information on the project and to receive specific feedback on the facilities and programs that would address values, issues, and needs identified at the User Group and Agency Workshops.

A meeting notice was sent out by the AGFD to the previously identified focus group representatives. The invitation list included many BASF user groups, from competitive shooting groups, to public safety officers, commercial groups, archers, and clay target users.

Exhibits included presentation boards showing: the study area, existing facilities, existing site features and amenities, existing boundary as well as the values, issues and needs from the User Group Workshop.

An overview of the current progress was offered to meeting attendees. Identification of values, issues and needs generated in the earlier User Group Workshop was also presented at the meeting. Attendees were encouraged to review the values, issues and needs that were identified in the user group meeting (see Section 4.2, *User Group Workshop*). Focus group members were randomly divided into four sections and asked to participate in a break-out session to discuss specific aspects of the BASF.

The intent of the break-out group discussions were to gather more specific detailed information about particular aspects of the facility from the various user group perspectives on four topic areas: parking/transportation, facilities, existing range improvements, and future range improvements. The wide variety of input and suggestions included: redesigning circulation, parking, and entrances; potential location of new facilities such as an educational complex, storage areas, pro-shop and restaurants; existing facility improvements such as redesigning certain ranges to accommodate different shooting events; and the development of new range facilities such as an expanded BACTC area, cowboy mounted and cowboy action shooters, and new range improvements such as a new specialty range for experienced certified shooters, a helice shotgun range, and a executive walking course. A complete detailed list of discussion items can be found in Appendix G, *Public Involvement Information*.

### 4.4 Public Open House

As the final step in the public involvement process, AGFD hosted a Public Open House to present the conceptual layout of the facilities in the Master Plan. The open house was advertised to the general public as well as to the user groups that had been contacted for the previous meetings. AGFD developed a Ben Avery Master Plan web page with a link to the draft plan, which was available for public review approximately two weeks prior to the meeting. The plan was presented as a draft version, and attendees were encouraged to provide feedback and comments on the proposed improvements. An open-house format followed the plan presentation so that attendees could further discuss the details of the plan with AGFD staff and its consultant. Attendees were able to submit comments by using the comment forms provided at the meeting or accessing the online form through the AGFD web site. Six comment forms were filled out at the meeting and two were received by mail after the meeting. Over 100 comments were received through the online comment form.

In general, individuals and user group representatives reacted favorably to the plan. Most concerns were centered on the proposal to split the High Power Range into two ranges, one with 1,000 yards and one with 600 yards. There were also concerns about the potential realignment of the Rifle Silhouette Range. Additionally, several people wanted to know the schedule for the proposed improvements as well as potential costs and funding sources.

The comment period stayed open for approximately two weeks after the open house, and the comments received throughout the process were considered in developing the Final Master Plan. A more detailed overview of the comments received at the open house is contained in Section G.3, *Public Open House Summary*, in Appendix G.

## 5.0 VISION, GOALS, AND OBJECTIVES

### 5.1 Introduction

The vision, goals, and objectives (VGOs) were developed from the values, issues, and needs identified from agency, user group, and focus group input identified in Section 3.0, *Agency Input*, and Section 4.0, *Public Participation*. The VGOs represent the foundation and action plan for the development and implementation of the BASF Master Plan.

The vision is a concise statement that embodies the key values identified by the community. The goals address key issues that relate to the values contained within the vision statement, and the objectives support each goal by identifying an action that causes the goal to be achieved.

#### **Vision**

*The Ben Avery Shooting Facility Master Plan seeks to provide a sustainable, world-class, multi-purpose facility that will engage and educate a diverse range of shooting sport enthusiasts of all ages and skill levels. This world-class facility will provide an anchor for the shooting community, while preserving and promoting sustainable practices and stewardship of the Sonoran Desert, and continue to be a point of pride for current and future generations.*

#### **Goals and Objectives**

**Goal 1: Develop a comprehensive multi-purpose, world-class facility that will provide and facilitate a wide range of shooting events.**

Objective 1.1: Develop an evaluation process that measures user satisfaction, and provides opportunities for user feedback and program adjustment.

Objective 1.2: Upgrade and improve facilities, based on user input and shooting sport trends.

Objective 1.3: Seek out opportunities for sustainable building practices and ecological design principles.

Objective 1.4: Explore opportunities to integrate technology into management, operations, and information dissemination.

Objective 1.5: Partner with local, state and federal agencies to ensure that the facility remains a viable resource for future generations.

**Goal 2: Develop a self-sustaining economic strategy.**

Objective 2.1: Seek out and utilize a variety of marketing strategies to increase program awareness, and identify new program opportunities for national and international tournaments.

Objective 2.2: Establish a process and procedure that will ensure fee collection from facility users.

Objective 2.3: Add and upgrade extended use facilities such as RV sites, camping, and retail and restaurant opportunities to capture additional revenue and provide more services to customers.

Objective 2.4: Increase the diversity of users by identifying under represented demographics, and tailor marketing and community outreach programs to these groups.

Objective 2.5: Develop formalized partnering relationships with user groups to pursue the design, funding and construction of specific master plan elements.

**Goal 3: Increase awareness of shooter safety and become a model for hunter, shooting sports and conservation education through participatory learning.**

Objective 3.1: Leverage existing volunteer relationships to provide local knowledge and expertise.

Objective 3.2: Provide workshops and hands-on experience that will educate all skill levels on firearm safety and shooting etiquette.

Objective 3.3: Increase awareness and ethical use of wildlife management as guiding principles in conservation education outreach.

**Goal 4: Develop a recreation program that appeals to outdoor enthusiasts of all types**

Objective 4.1: Explore new partnering opportunities with outdoor recreation clubs and organizations.

Objective 4.2: Provide training opportunities for outdoor recreation groups such as wilderness survival skills, backcountry camping, and off-highway vehicle safety and wildlife viewing.

Objective 4.3: Cultivate existing relationships with user groups to ensure that current and future facility and recreation needs are met.

**Goal 5: Develop a robust community stewardship program that will become a catalyst for local community participation, outreach, and growth.**

Objective 5.1: Provide wildlife stewardship and conservation expertise to local community development projects.

Objective 5.2: Foster local relationships with adjacent land-owners.

Objective 5.3: Maintain and promote the facility as a non-exclusionary, affordable public resource.

Objective 5.4: Cultivate existing relationships with the community at large to ensure that current and future facility and recreation needs are met.

## 6.0 CONCEPTUAL MASTER PLAN ALTERNATIVES

### 6.1 Introduction

Five Conceptual Alternatives were developed for the BASF Master Plan. Each presented an approach based on site resources, appropriate recreational facilities needed to meet current and future demands, and input from user groups and AGFD. The National Rifle Association's *The NRA Range Source Book: A Guide to Planning and Construction* and AGFD's *A Strategic Plan for the Development of Arizona Shooting Ranges* were used for general guidance in the development of the conceptual alternatives. However, during detailed design, specific attention must be paid to updated industry guidelines and safety requirements for specific facilities. The conceptual alternatives were developed to present variable scenarios, ideas, and pros and cons for the agency to consider and discuss.

Each of the alternatives dealt with the following priorities:

- Developing entry access and circulation to alleviate congestion within the site and on approach to site.
- Providing security-controlled access to regulate facility users.
- Incorporating revenue-generating opportunities and uses.
- Maintaining existing elements of the facility that work well and changing those that do not.
- Meeting the pressures of population growth in Phoenix and potential increase in facility use.
- Preparing for continued growth of the AGFD Annual Exposition.

### 6.2 Conceptual Master Plan Alternatives

#### **Conceptual Alternative A**

Conceptual Alternative A concentrated on revising internal circulation, incorporating input from the cowboy action shooters and cowboy mounted shooters in the western area of BASF, and relocating many visitor and administration functions to a new entry along the Carefree Highway. A new main entryway was located approximately one mile east of the new AGFD headquarters intersection, near the southeast corner of the High Power Range. The one-mile distance was used so that the intersection could be signalized if warranted by future demand and coordinated with future development. The main entry allowed for a controlled central access point as well as a campus that included an administration building, a range check-in, a pro shop, and meeting rooms. Secondary access to the facility would be maintained through the AGFD headquarters site, and the existing entryway would be used for special event or maintenance access only. The controlled access would allow for greater regulation of visitors to and from the facility, and the new range check-in would allow for better accountability of patrons and scheduling of events throughout the range. Internal circulation was also revised to provide a road around the south side of the High Power Range so that a primary circulation route to the BACTC, Archery and specialty ranges would be available at all times. Other improvements included in the alternative were: a new Trap and Skeet field and a new Sporting Clays course; a new area for the cowboy action shooters, including pistol bays, mounted-shooting arenas, RV campground and parking; and a new 300-yard range for Department of Public Safety (DPS) use.

#### **Conceptual Alternative B**

Conceptual Alternative B also relocated the main entry and concentrated on improvements to the public range area. The new main entryway was located one-half mile east of the new AGFD headquarters to the southwest of the High Power Range. Although this location probably would not be signalized in the future, it would move traffic farther west along the Carefree Highway, to about one mile from the Carefree Highway/I-17 traffic interchange, and therefore alleviate traffic congestion. The entry design would allow for a controlled central access point that also incorporated an administration building, a range check-in, an indoor range, and meeting rooms and that would be easily identified and accessible to visitors of the facility. Circulation provided a loop along the southern edge of the High Power Range back to the Carefree Highway as a one-way exit only. Secondary access to the facility for only AGFD staff was maintained through the AGFD headquarters site, and the existing entryway would be closed to general

use and would be used only for special event or maintenance access. Other improvements included in this alternative were doubling the size of the Trap and Skeet fields and Sporting Clays courses, providing an additional campground at the BACTC; expanding the main public range; and, to the west, developing an action-shooting area north of BACTC and an Indoor Archery Range, improving the Hunter Education area, and expanding the existing Shooter's Campground.

### ***Conceptual Alternative C***

The intention of Conceptual Alternative C was to make more use of existing roads and facilities. The plan kept the existing main entry location and provided an additional waiting lane along the Carefree Highway to alleviate congestion. On-site, the main entry was redesigned to allow for a controlled central access point and a campus area that incorporated an administration building, a range check-in, an indoor range, and meeting rooms. Circulation provided a loop back to the Carefree Highway near the southeastern corner of the High Power Range as a one-way exit only. Secondary access to the facility for only AGFD staff was maintained through the AGFD headquarters site. Other specific improvements incorporated in this alternative included a new Sporting Clays course north of the existing Trap and Skeet field, a new Trap and Skeet field, an expanded main public range, an expanded campground, improvements to current action-shooting ranges, improvements to the Hunter Education area, and the expansion of Archery facilities and ranges.

### ***Conceptual Alternative D***

Conceptual Alternative D made fewer changes to the existing circulation than Alternative C. This alternative kept the existing main entryway as is, and it expanded the existing facilities at the main public range by adding an administration building, new activity center, and range facility offices. The existing main entry would continue to direct traffic to the interior of BASF to the expanded administration complex. This circulation configuration provided a loop back to the Carefree Highway near the High Power Range as a one-way exit only. Secondary access to the facility for only AGFD staff was maintained through the AGFD headquarters site. Additional improvement included in this alternative were improvements to the Hunter Education area, a new Sporting Clays course north of existing Trap and Skeet fields, a new Trap and Skeet field, an expanded main public range, mounted-shooting improvements in the existing primitive camp area, new action-shooting bays near the Archery Range and the FITA Range expansion, including an indoor archery range.

### ***Conceptual Alternative E***

This alternative incorporated key ideas from Alternatives A through D. It included a new main entryway located one mile east of the new AGFD headquarters intersection. This new entry location could be signalized in the future. However, it would move traffic west along the Carefree Highway, away from the Carefree Highway/I-17 traffic interchange, and thus would help reduce traffic congestion. In this alternative, the entry incorporated a visitor kiosk and vehicular staging area, but other facilities such as an administration building, a range check-in, a pro shop, a restaurant, and an educational complex were located at the newly expanded main public range. Circulation provided a loop along the southern edge of the High Power Range back to the Carefree Highway as a one-way exit only. Secondary access to the facility was provided through the AGFD headquarters site, and the existing entryway was removed. Other improvements included doubling the size of the Trap and Skeet fields, two 16-station and one 10-station mining-themed Sporting Clays courses, and action-shooting and long-range bays near Archery, as well as expanding and moving all Archery Ranges to the north.

### ***Revised Conceptual Alternatives F and G***

Conceptual Alternatives A through E were presented to AGFD staff, and additional priorities focused more on programming issues, such as tournaments and large shooting events, were considered. Although Alternatives A through E attempted to incorporate as much input from each user group as possible, input from the groups was extensive and revealed a wide variety of needs and desires. This input suggested that multi-use facilities would be required to meet such diverse needs and desires. Two revised conceptual alternatives, Alternatives F and G, were developed with input from AGFD to further refine and distill the ideas presented in the original alternatives. Both alternatives included a new main entryway located one mile east of the new AGFD headquarters to the southeast corner of the High Power

Range. Alternative F included a secondary public entrance located southwest of the existing High Power Range and one-half mile east of the AGFD headquarters intersection. Alternative G used the AGFD headquarters intersection as a secondary access to BASF, particularly for the BACTC and the Archery Range. The new main entry incorporated a visitor kiosk and vehicular staging area, but other facilities, such as an administration building, a range check-in, a pro shop, a restaurant, an indoor shooting range and an educational complex, were located at the newly expanded public range. Both secondary entrances gave direct access to the BACTC and the Archery Range as well as direct access to RV parking.

Alternative F included a split of the High Power Range into two ranges with 60 points for the 1,000-yard range and 30 points for the 600-yard range. Alternative G maintained the full 100 points on the High Power Range. Each alternative proposed a potential realignment of the Rifle Silhouette Range for more efficient use of space. Both alternatives provide some expansion of the Archery facilities, with Alternative F showing slightly fewer improvements in terms of indoor facilities and FITA Range expansion. Both alternatives included a new 10-station walking Archery course. Some of the other features common to each of these alternatives were new Trap and Skeet fields east of existing fields, improved and expanded BACTC dedicated RV campgrounds and visitor centers, a DPS 300-yard range, and five additional 100-yard multi-use pistol/Small Bore bays.

## 7.0 DRAFT MASTER PLAN

### 7.1 Introduction

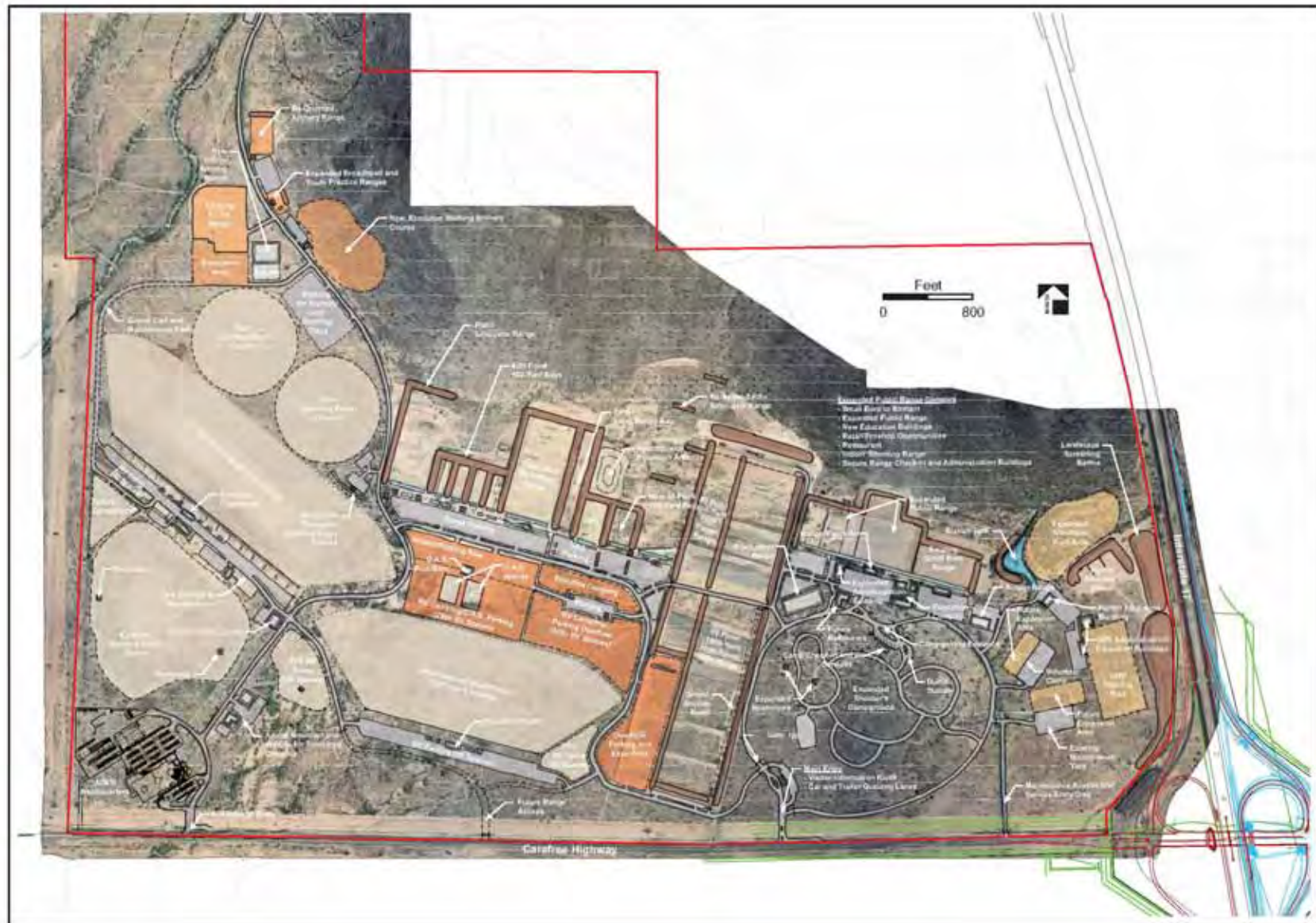
Based on the opportunities and constraints of the site, previous user and focus group input, as well as additional AGFD staff reviews, a Draft Master Plan was developed. A graphic map of the Draft Master Plan was presented to user groups and the general public in order to solicit additional comments and suggestions, at a Public Open House held on October 6, 2007. Comments and input received at this meeting were considered by AGFD during the development of the Final Master Plan.

### 7.2 Draft Master Plan

The Draft Master Plan maintained the focus on hosting opportunities for competitions and larger shooting events, while further refining and combining the best practices and opportunities from previous alternatives. Generally, the plan improved vehicular circulation to and from the facility and within the property itself, and accommodated facility upgrades to provide a higher level of service and enhanced recreation opportunities for range users and spectators alike. The plan also created opportunities for increased revenue streams to support implementation of the Master Plan. As with Alternatives F and G, the theme of developing facilities to address multiple uses became a primary focus in considering improvements that would enhance the shooting experience at BASF for as many people as possible. Nearly all elements, from new ranges to park/RV areas and buildings, were planned to be as flexible as possible to meet multiple current and future uses.

The Draft Master Plan (Figure 12) maintained the proposed location of the new main entryway one mile east of the new AGFD headquarters lighted intersection, just to the southeast of the existing High Power Range. This entry alignment, as discussed in previous alternatives, would move traffic farther west along the Carefree Highway and would allow for a controlled central access point. The entry incorporated a visitor kiosk and vehicular staging, but other facilities, such as a range check-in, expanded administration buildings, and a new pro shop, were located within an expanded public range and administration/education complex. The campus-like plan also included a location for a possible restaurant, a future indoor shooting range, an improved Shooter's Campground entrance/check-in, and an expanded educational complex. The Draft Master Plan used the AGFD headquarters entrance as a second access point to BASF, which would give direct access to the BACTC and Archery Ranges as well as direct access to numerous RV camping/parking opportunities. A third access point, earmarked for future entry/exit, was proposed one-half mile east of the AGFD headquarters site. As facility use increases and events continue to grow, this access point may provide valuable entry and exit-only access in specific situations. The existing and original main entry, as shown in previous concepts, was closed to public access and gated for use as a maintenance and service road. Additional improvements shown on the Draft Master Plan included the following:

- Archery and FITA Range to remain at current location with expansion to accommodate international events and location for an indoor archery range.
- A new line of Trap and Skeet fields east of existing fields, aligned parallel to the main ranges and sized to accommodate 14 trap and 4 trap/skeet combo fields.
- New BACTC business center and pull-in RV parking and camping near both the new and existing BACTC visitor centers.
- New 10-station executive Sporting Clays course and new executive walking Archery course with adjacent parking.
- Realignment of the Rifle Silhouette Range parallel to High Power Range and most existing shooting bays.
- Five new 100-yard multi-use bays and a DPS Long Range (300 yards).
- High Power Range divided with 60 points for the 1,000-yard line and 30 points for the 600-yard line.
- Additional overflow parking and expo area along the eastern side of the new Trap and Skeet fields.



**Figure 12. Draft Master Plan (as presented at the Public Open House on October 6, 2007)**

## 8.0 FINAL MASTER PLAN

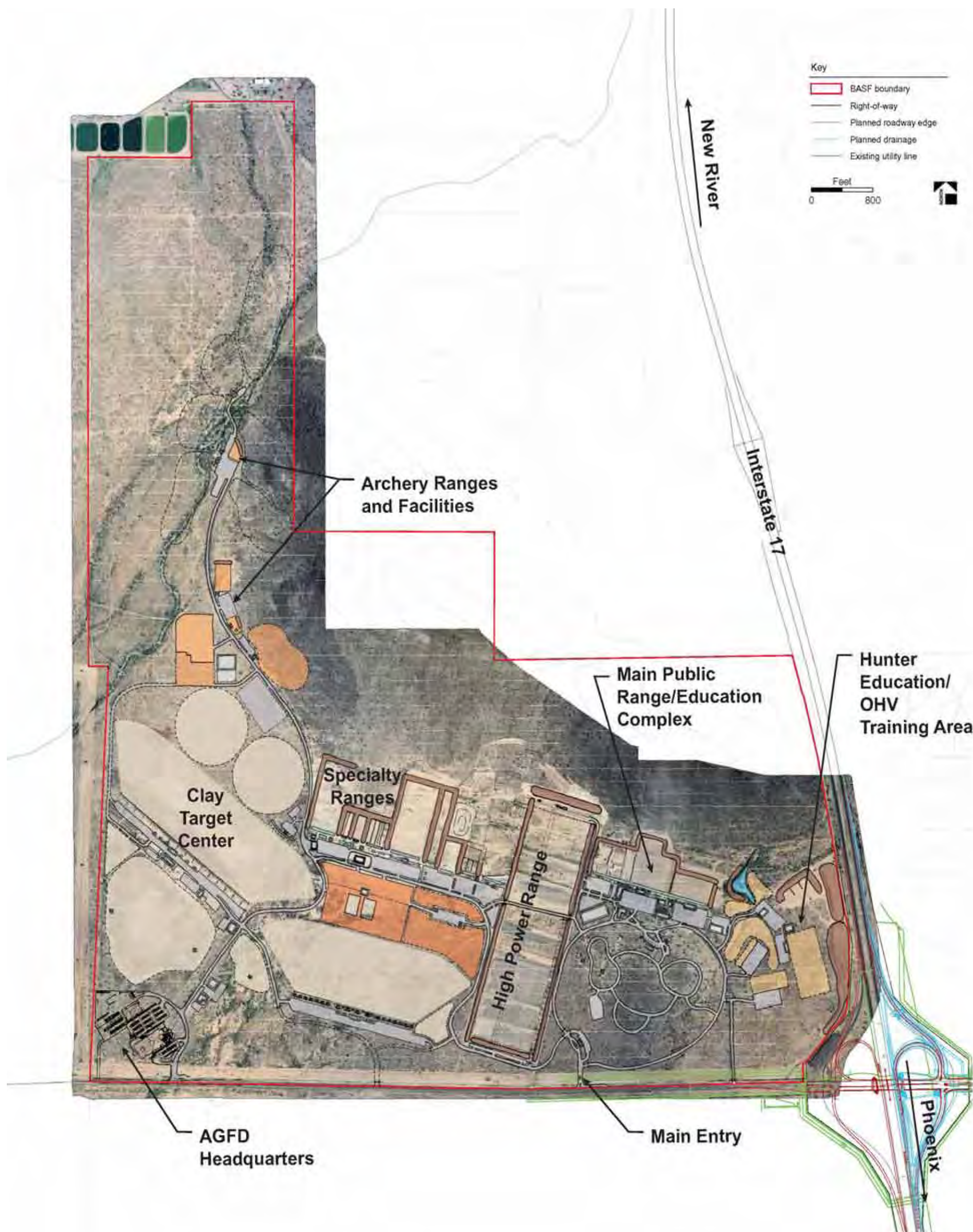
### 8.1 Introduction

Based on comments received at the Public Open House meeting and through reviews by AGFD staff, the Draft Master Plan was revised and the Final Master Plan was developed. The Final Master Plan is a conceptual guide for the future development of BASF, and many details will be defined when plans are developed for a specific improvement at the facility. AGFD is committed to continuing to work with the user groups at BASF to develop those details. The long-term success of BASF as a premier shooting facility will be greatly enhanced by working together to develop the best opportunities to provide quality services and experiences to the widest range of shooting enthusiasts.

### 8.2 Final Master Plan

The Final Master Plan (Figure 13) is based on site resources and opportunities and constraints, as well as the extensive input received from the user groups and AGFD staff. The plan remains consistent with the AGFD Strategic Shooting Range Development Policy and maintains an emphasis on developing flexible, multi-use facilities. Figure 13, *Final Master Plan*, illustrates the integration of range and facility improvements within existing site amenities and the new features proposed at the facility. The plan serves to minimize impacts while maximizing the BASF's potential as a world-class, multi-use shooting facility. Care was taken to use the most effective and up-to-date resources available to accomplish the planning effort, including AGFD's *A Strategic Plan for the Development of Arizona Shooting Ranges* and the National Rifle Association's *The NRA Range Source Book: A Guide to Planning and Construction*. However, during any detailed design and development of ranges and facilities that may follow this master-planning effort, special attention must be made to use all updated industry standards, guidelines, and safety requirements available. The implementation of the Final Master Plan will address ADA accessibility throughout BASF as part of the development of plans for a number of facility-wide improvements.

For description purposes, the Final Master Plan has been divided into five main geographic areas of development, identified by their existing and planned uses as well as the types of ranges and their associated activities. A sixth area of discussion has been developed to provide an overview of proposed improvements to utilities and infrastructure on the BASF site.



**Figure 13. Final Master Plan**

### **8.2.1 Utilities and Infrastructure Overview**

*Figure 14, New Utilities* provides a general visual of the proposed new utilities at BASF. Descriptions of the proposed new utilities and additional facility-wide infrastructure improvements are detailed below.

#### *Water*

The proposed water line improvements to the Ben Avery Shooting Range consist of a looped system of 8" and 12" piping. The primary loop will be constructed with 12" pipe and will connect to a 16" City of Phoenix (C.O.P.) water main running east-west along the north side of the C.O.P. water line easement, located on the north side of Carefree Highway in two locations. Fire hydrants and service connections will be installed as needed. A subsidiary 8" water line loop on the western portion of the property, will connect to the proposed 12" waterline in two locations and provide service to the Archery ranges and facilities, located north of the BACTC.

#### *Wastewater*

The proposed wastewater system improvements for BASF consist of two independent systems servicing both the east and the west sides of the facility. The divide between the service areas will occur at the High Power Range, located at the center of the site. Each system will collect effluent and transmit it by gravity flow to wet wells and lift stations, located adjacent to the taps which were installed during the construction of the 8" diameter C.O.P. pressure sewer main. This C.O.P. pressure sewer main runs east-west along the north side of the C.O.P. water line easement on the north side of Carefree Highway, parallel to the 16" C.O.P. water line.

Precise locations and sizes of water and sewer lines as well as the locations of fire hydrants should be determined by developing a Utility Master Plan based on the final results of the present facility master planning effort.

#### *Electrical/Telecommunications/Dry Utilities Improvements*

As outlined in the site analysis and inventory section of the document, there are existing underground power and telecommunication lines as well as existing overhead power lines at BASF. Relocation of all power lines, telecommunication lines and any additional dry utilities shall be placed underground. Power supplies should be stubbed to all ranges, vendor areas and RV camps to allow for the future installation of range lighting, PA systems, electric targets and "live-fire" range indicators. Telecommunication lines should be stubbed to all existing and new range facilities, including all range firing lines, to allow for a dedicated, emergency phone line.

#### *Roadway and Circulation Improvements*

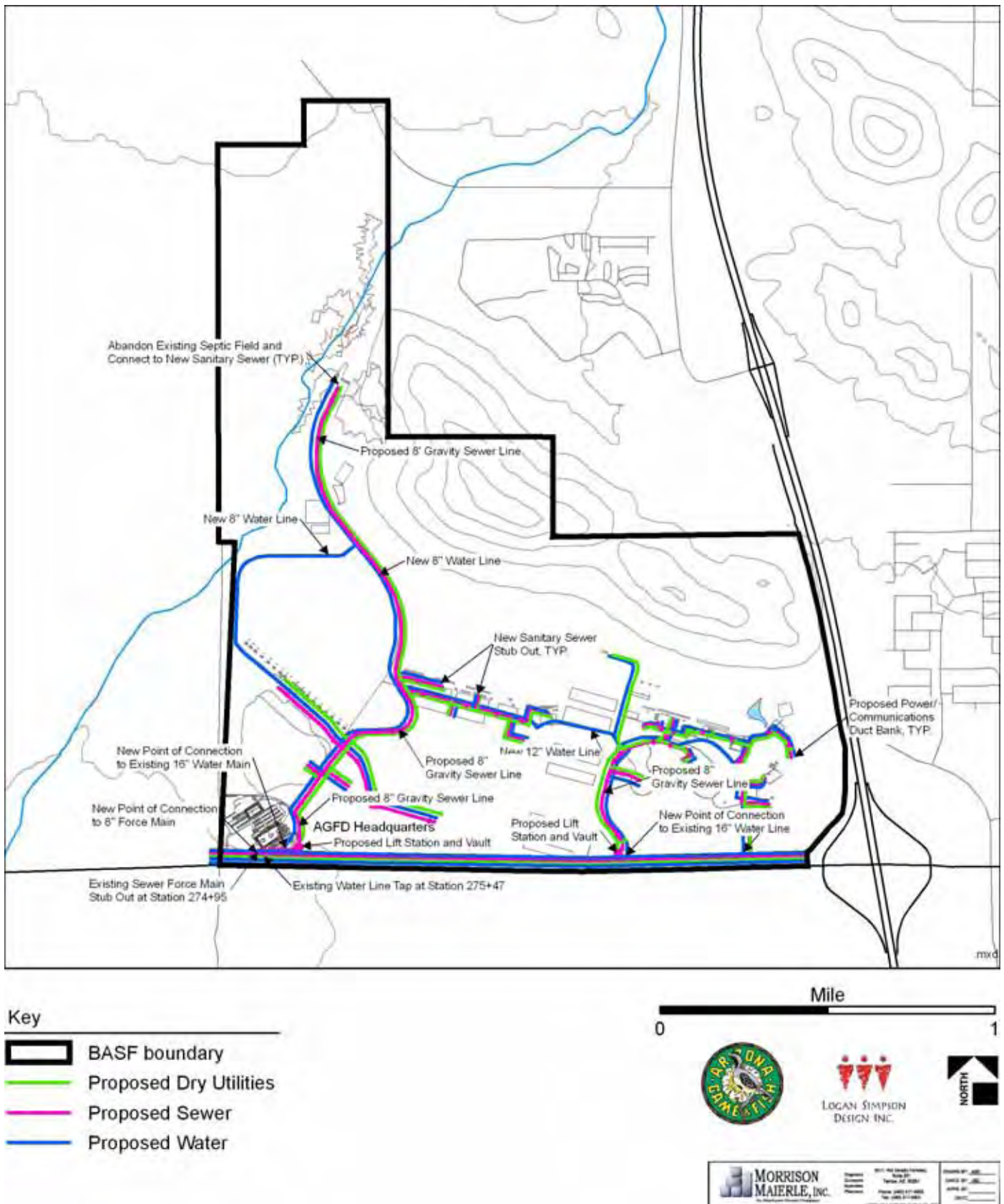
Roadway and circulation improvements are considered integral components to the BASF Master Plan. The roadway character should remain rural, without a curb and have native vegetation along its edges to prevent unauthorized parking. All interior roads should be repaved to accommodate heavy-duty vehicles and increased traffic volumes. Roads have been realigned to allow for large and emergency vehicle use, while decreasing the number of difficult turns and irregular intersections. Speed bumps, pedestrian crosswalks and additional traffic calming measures should be located, as necessary, near all pedestrian areas and range locations. Improved signage and wayfinding elements shall be included in the roadway and circulation enhancements.

#### *Other Facilities*

In addition to ADA-compliance, there were a number of facility-wide improvements suggested by AFGD staff and user groups alike, to be incorporated in the Final Master Plan. These recognized additions shall occur throughout the range and include:

- Storage facilities located near parking areas.
- Shade structures and seating opportunities for spectators.
- New firing line range furniture and new tables for firearm preparation, inspection and cleaning duties.
- Improved and stabilized pedestrian and cart paths.

- Moveable bleachers for event use.
- Improved range berms (to comply with current Department standards and NRA safety guidelines and allow for maintenance vehicle access along top of berms).
- Address drainage concerns at individual ranges.
- Construct additional berms as required for visual screening.

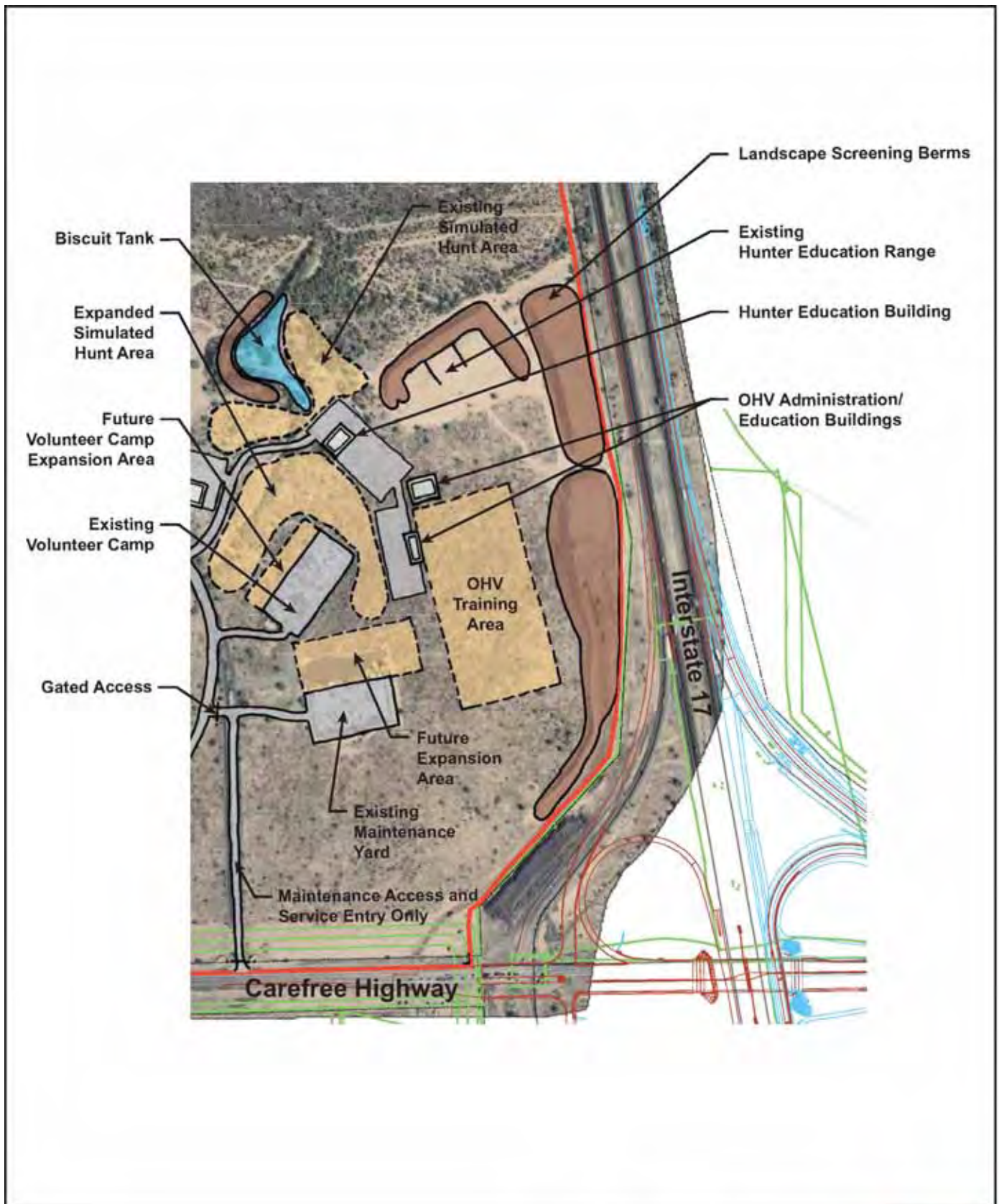


**Figure 14. New Utilities**

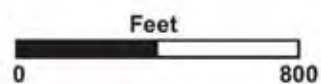
### **8.2.2 Hunter Education/OHV Training Area**

The Hunter Education/OHV Training Area is in the eastern part of BASF and includes Hunter-Education classroom and range facilities, field training areas, OHV training, and volunteer facilities. This area also includes Biscuit Tank and maintenance yards. Figure 15, *Hunter Education/OHV Training Area*, illustrates the conceptual configuration for this area. AGFD will engage in ongoing public participation and seek user group input during the detailed design and development of plans and individual program elements for this area. This approach will ensure that development of this facility meets a wide range of needs by providing additional guidance, future range innovations, up-to-date safety standards, and best management practices. The Final Master Plan identifies the following features, facilities, and improvements to be included in the development of the Hunter Education/OHV Training Area:

- Improve Biscuit Tank for use as a facility for education programs.
- Retain the simulated hunt area and expand the existing field training area near the volunteer camp to allow for simultaneous sessions.
- Keep the Hunter Education 'Live-Fire' Range in its current location and continue with improvements for shooter safety and comfort.
- Build a permanent Hunter Education building with improved parking, permanent restrooms, water fountains and direct access to the shooting range.
- Develop new OHV administrative and education areas adjacent to OHV Training Area to host workshops on safety and other OHV-related programs.
- Continue to improve screening berms and landscaping along I-17 and the Carefree Highway to act as buffer from ranges.
- Improve the volunteer camp to provide up-to-date RV hookups and on-site laundry facility, and replace structures in poor condition. Expand camp to increase the number of volunteer campsites.
- Expand/renovate existing maintenance yard.
- Close existing BASF entry and allow use only by maintenance and service personnel.
- Develop a separate entry off the main loop road for access to the Hunter Education Area and to improve roadway circulation.



**Figure 15. Hunter Education / OHV Training Area**



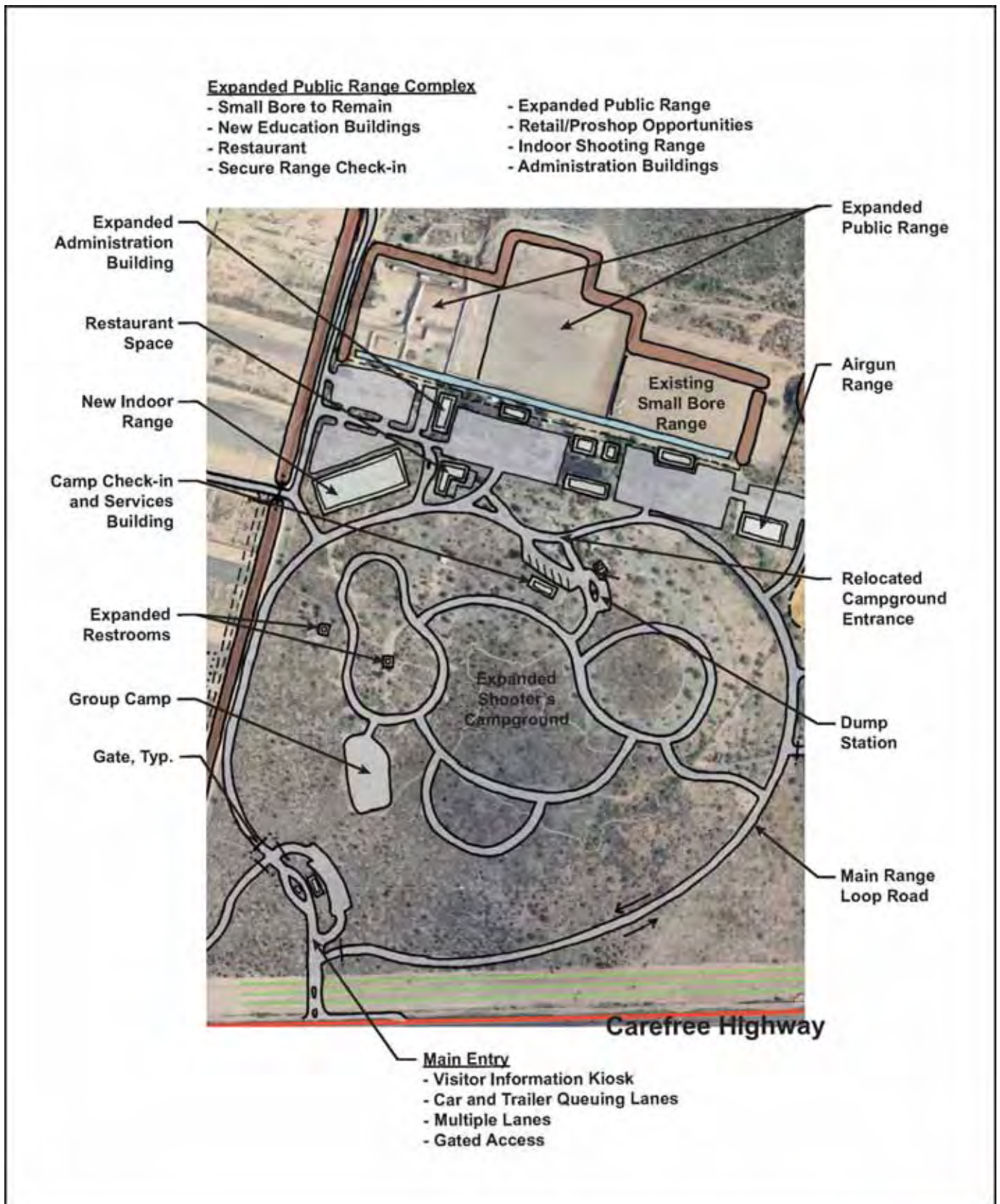
### **8.2.3 Main Public Range and Education Complex**

The Main Public Range and Education Complex includes the main public range, an education complex, Shooter's Campground, and a new main entry. Figure 16, *Main Public Range and Education Complex*, illustrates the conceptual configuration for this area. AGFD will engage in ongoing public participation and seek user group input during the detailed design and development of plans and individual program elements for this area. This continued input will further enhance the shooting and education experience at BASF and ensure the development of a world-class facility. The Final Master Plan proposes that the following features, facilities, and improvements be included in the development of the Main Public Range and Education Complex.

- Relocation of the main BASF entry one mile east of the lighted intersection at the AGFD headquarters. This would move traffic on the Carefree Highway farther west of I-17, which reduces traffic congestion and problems associated with large events and long vehicle lines before the facility opens. Development of the main entry should include the following improvements:
  - Multiple lanes of ingress and egress.
  - Gated access control to interior areas of BASF.
  - Westbound right-turn lane along the Carefree Highway into BASF.
  - Divided entry with kiosk for visitor information, such as hours of operation and emergency numbers. The kiosk should be developed so that it can be manned by AGFD staff as needed for large events.
  - Separate car and trailer staging area that allows early visitors to stage in a site off the Carefree Highway before the facility opens.
- Expansion/enhancement of the Shooter's Campground. Improvements including realignment and improvement of existing sites, expanded restroom facilities, and an improved campground entrance. Campground development should also include the following:
  - Relocation of dump station so that it can be used without going through campground.
  - Relocating and improving camp host facilities with a permanent shade structure near main entry.
  - Development of a new camp check-in and services building at the main entry with short-term parking. Building may include laundry facilities, permanent restrooms, a bulletin board, and a general store.
- Expansion and development of the main public range and education complex. This development will enhance the visitor experience and provide AGFD with improved administration and range management facilities. The proposed plan will also greatly expand AGFD's ability to offer a wide variety of education opportunities and meeting facilities for individuals and user groups. Improvements proposed in this area are as follows:

#### *Range Area*

- Development of a new, secure range check-in building centrally located on public range with security fencing to protect unauthorized entry to range. All range users must check in at this facility prior to range access. Range check-in building will include armory for range-owned firearms.
- Expansion of existing public range into the 2700 and Running Boar Ranges.
- Expansion of main public range to 200 yards in select locations. Also consider development of a limited number of 300-yard firing points adjacent to the High Power Range, if construction is feasible. Because of the popularity of new-caliber firearms and the increased quality of optics, there is an increasing general-use demand for a range with a 300-yard firing line. This demand may continue to increase in the future.
- Use of new concrete block walls (CMU) as range separators, as appropriate.
- Expansion of administration and Range Safety Officer building, including permanent restrooms available to the public.



**Figure 16. Main Public Range and Education Complex**

- Retail development area located for easy accessibility in public range area. The restaurant/retail space could include a pro shop for retail sale of ammunition, safety gear, and other shooting accoutrements; dining/snack bar; and separate delivery/dock area at the rear of the building.
- A site for a future indoor range, with adjacent parking. Design considerations for the indoor range as identified by user groups, include: a .22-caliber indoor Olympic-style range with 50-meter bays and turning targets.
- Restoration and improvement of the Air-Gun Range to industry standards, including expanded parking and a separate access road. Storage and other uses would be moved to new locations. Design considerations for the Airgun Range include the following:
  - Air-conditioned facility.
  - Room for equipment setup.
  - Spectator or viewing area.
  - Olympic style shooting targets.
- Expansion and improvement of parking throughout the main public range and education complex, including the administration building and proposed indoor range.
- Retainment of the Small Bore Range in its current location. Design considerations for future improvements include the following:
  - New target stands at 50-yard and 100-yard locations.
  - Silhouette target lighting.

*Education Complex (see Figure 17)*

- Development of additional classroom/meeting rooms centered on a campus courtyard. The buildings and support facilities should be designed to accommodate large user group meetings and events as well as small specialized training and education classes. It is important to note that the new AGFD headquarters includes internal (limited use) conference rooms and a 200-person auditorium available for use by reservation, which will complement the uses planned for the BASF education complex.
- Shade nodes for general public and shooting spectators.
- Classroom and final building layout will be determined by user group needs and input from Hunter Education groups, OHV users, trainers for concealed weapons permits, DPS, and other user groups with needs for classroom and meeting space.



**Figure 17. Education Complex Detail**

#### **8.2.4 Specialty Ranges**

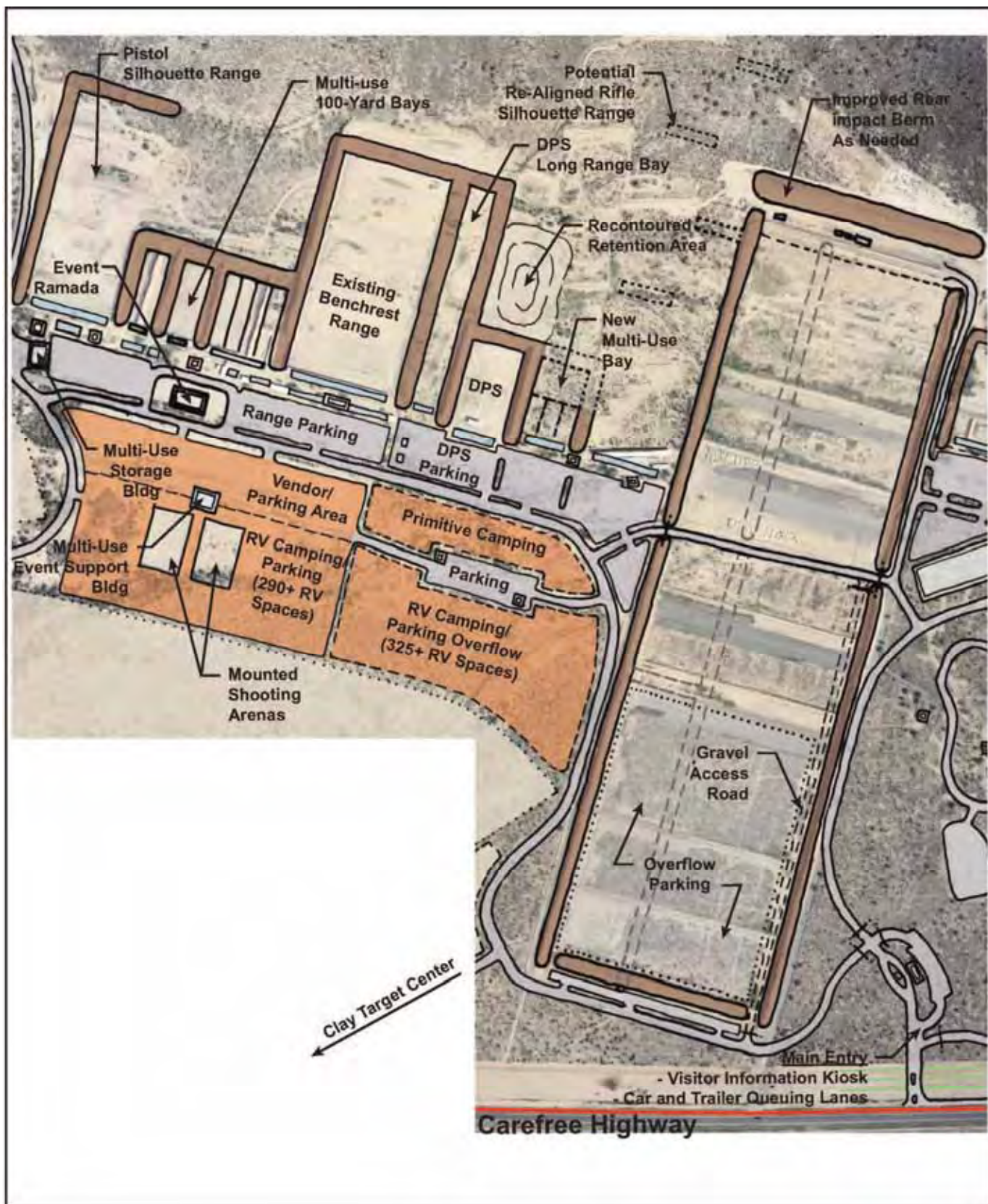
Figure 18, *Specialty Ranges*, illustrates the conceptual configuration of this area. AGFD will participate in ongoing public participation and seek user group input during the detailed design and development of individual program elements. This input and feedback process will further enhance the ultimate design for the specialty ranges at BASF and will ensure the development of a multi-use facility that accommodates both general use and a wide variety of events and general use. The specialty ranges include the High Power Range and the shooting bays to the west, and including, the Rifle Silhouette Range. The BASF Master Plan proposes that modifications to several existing ranges, including Benchrest and Pistol Silhouette, be minimal but include: additional utilities (water, sewer, phone) to existing and new buildings. Parking and roadway circulation have been improved to provide a permanent route around the High Power Range. The existing road through the High Power Range would be retained for service and maintenance access and would serve as the utility corridor to connect the public range area with the specialty range area. Specific improvements proposed by the BASF Master Plan are described as follows:

##### *High Power Range*

- Retain current 100-point 1,000-yard distance based on current demand and support for large events. AGFD will retain the option to divide the High Power Range to create a 60-point 1,000-yard range and a 30-point 600-yard range, if large events are not sustained. AGFD will continually seek to provide flexible, multi-use facilities to meet the needs of the broadest range of shooting enthusiasts.
- Improve the gravel access road to facilitate the use of the range as overflow parking during large events and the annual Exposition. Overflow parking will be moved to the areas between the firing lines from 600 yards to 1,000 yards. The overflow parking areas will be improved with gravel parking surfaces.
- Improve the main impact berm at the rear of the target mound to meet industry standards.
- Place new access gates at both ends of the bypass road as well as at each end of the gravel access road to enable a secure and safe shooting environment. Primary circulation is planned to loop around the High Power Range. The road improvements to Calle Silhouetta and other roads should be realigned to provide better vehicular circulation and turning for RVs, buses, and equipment trailers.
- Additional considerations for detailed design of the High Power Range include the following:
  - Better signage to indicate the in-use status of High Power Range.
  - Station markers.
  - Number bricks at firing mounds.
  - Additional storage in the pits.
  - Ability to hold NRA match certifications.

##### *Rifle Silhouette Range*

- Retainment of range in current alignment, with ability to review an option to realign so that firing line is parallel to the adjacent ranges in the area. The realignment could provide for better use of the site, and allow expansion and renovation development of adjacent ranges. The realignment should be assessed, especially regarding the costs to move existing improvements and safety standards at the time of development.
- Additional consideration for detailed design at the Rifle Silhouette Range are as follows:
  - Additional parking south of the High Power Range access road.
  - Replacement of existing targets with new metal targets.
  - Increased number of gun racks at lines.
  - Additional shade structures and permanent restrooms in waiting area.
  - Allowance for lateral movements along the Rifle Silhouette firing line.
  - Additional banks of targets.



**Figure 18. Specialty Ranges**

### *Department of Public Safety Range*

The Department of Public Safety Range is primarily the responsibility of DPS, which has a lease agreement with AGFD for use of the area as a separate DPS Range. The following improvements were developed during the user group and focus group input process but would not be the specific obligation of AGFD. AGFD will continue to partner with DPS and local law enforcement agencies to provide necessary training opportunities and may consider cost-sharing opportunities to increase the accessibility of ranges and improvements to other user groups and the public:

- Provide dedicated DPS parking.
- Provide additional permanent storage opportunities.
- Design other ranges to include the planning for development of a 300-yard long-range bay for use by DPS and federal, state, county and local law enforcement agencies and general public use.
- Further coordination with DPS and local law enforcement agencies, as indicated in the goals and objectives (see Section 5.0) developed for BASF, will allow for specific details to be determined as designs are developed.

### *Existing Benchrest Range*

- Improve lateral and rear impact berms and fully enclosed range to industry standards.
- New range building with restroom facilities and expanded shade structures for shooters and spectators.
- Additional access to parking to improve site circulation.
- Detailed design considerations for the Benchrest Range to include the following:
  - Addition of 12 to 20 more benches on range with shade structures.
  - Replacement of existing targets.

### *Pistol Silhouette Range*

- Expand existing range to 300-yard mark and include improvements to all existing berms and shade structures.
- Develop two new permanent range buildings including scoring, restrooms and classroom space.
- Additional detailed design consideration for Pistol Silhouette Range are as follows:
  - Additional banks for Olympic-style events.

### *Multi-Use Bays*

- Develop 100-yard multi-use bays between the Benchrest Range and Pistol Silhouette Range. Existing short- to mid-range pistol bays would be reconfigured to provide more opportunities for simultaneous multi-use shooting events. The conceptual layout in the Master Plan includes two 25-point 100-yard bays and four 60-foot-wide narrow shooting bays. Alternative configurations will be considered as part of the ongoing communication with user groups during development of specific plans.
- Develop a range directly to the east of the DPS Range, which includes three 50-yard multi-use ranges, with an option to develop into 100-yard bays, if the Rifle Silhouette Range is realigned.
- Detailed design considerations for Multi-Use Bays include the following:
  - Improve lighting (stadium lighting).
  - Develop facility to meet criteria for holding national matches.
  - Consideration of new ranges to allow varying angles of fire (lateral and down-range movement).
  - Addition of Practical Pistol shoot house on range.
  - Provide ability to include portable moving target equipment, including proper protective berm at one or more ranges.

#### *Pull-Through Multi-Use Storage Facility*

- A new storage facility, capable of handling semi-trailer traffic is proposed near the Pistol Silhouette Range at the intersection of Calle Silhouetta and Archery Roads. This building will allow user groups to store their range equipment more efficiently than using the existing maintenance facility located at the far east side of the property. This new building would be approximately 80 by 100 feet with sliding double-bay doors and an oversized pull-through access drive to accommodate large vehicles. This storage facility would likely be developed through a partnering agreement with user groups to maximize the benefit of the facility for all users.

#### *New Event Ramada*

- Develop a new event ramada of approximately 80 by 140 feet in the range parking area adjacent to the specialty ranges and mounted shooting areas. The event ramada site will have access to power, water, sewer, and telecommunications utilities.
- The event ramada and surrounding grounds are available to user groups, competitions, and other shooting events as well as the AGFD Annual Outdoor Exposition. AGFD would partner with user groups to develop this proposed improvement, which would maximize the benefit of the facility for all users.

#### *Multi-Use Event Support Area*

- This area is located to the south of the special use ranges and is intended to support large and special use events that occur in this portion of BASF. The Master Plan for this area includes the following improvements:
  - Reconfigure the primitive camping area to provide additional dedicated parking and permanent restroom facilities.
  - Develop a vendor and retail plaza with a new multi-use building to accommodate special shooting events and the AGFD Annual Outdoor Exposition and access to power, water, sewer, and telecommunications utilities.
  - Develop 2 mounted-shooting arenas and space allocated for dry RV camping, overflow parking, horse trailers, and temporary horse corrals.
  - Provide additional RV camping overflow spaces adjacent to mounted shooters arena and primitive camping areas. This RV camping area may be a combination of dry and full hook-up sites to accommodate various user groups and special events.
- Additional considerations for detailed design of the Multi-Use Event Support Area include the following:
  - Utilities to include water, power, telecommunications.
  - Lighted event areas and parking.
  - Permanent restroom buildings.
  - Sewage dump station.
  - Expanded camping spaces.

### **8.2.5 Ben Avery Clay Target Center**

Figure 19, *Ben Avery Clay Target Center and AGFD Headquarters*, illustrates the conceptual configuration of this area. Additional public participation, including user group input and community outreach data collected during the detailed design and development of individual program elements, will further enhance this facility at BASF. The BACTC includes: existing and new Trap and Skeet fields, two visitor centers, existing and new Sporting Clays courses, a new executive Sporting Clays course, RV camp sites, and AGFD's Wildlife Center and Wildlife for Tomorrow Complex, as well as direct range access through the AGFD headquarters entry and a future range access point. The following improvements are proposed in the Final Master Plan:

#### *Existing Trap and Skeet Fields*

- Expand and improve existing BACTC business and visitor center.
- Reconfigure parking and entry road to accommodate larger traffic volumes.
- RV camp with 40 full hook-up sites directly adjacent to main facility.
- Develop an adjacent primitive campground.
- Develop additional multi-use buildings, storage facilities, and cart storage/service areas.
- Additional detailed design consideration for existing Trap and Skeet fields should include a shade structure and water fountain at each trap location.

#### *New Trap and Skeet Fields*

- A new Trap and Skeet overlay is proposed in the large open space area between the existing Trap and Skeet fields and the High Power Range. These new fields have been placed parallel to the main ranges to maximize space for other uses. The new field would increase the capacity for Trap and Skeet events currently offered by BASF. A final determination of the number of Trap and Skeet overlays will be determined in the detailed design phase.
- Develop additional facilities including a new visitor center, shade structures, and adjacent parking.
- Provide daily RV parking, adjacent to the new parking area, for approximately 90 vehicles.
- Additional design consideration for New Trap and Skeet fields are as follows:
  - Shade structure and water station at each trap location.
  - Provide observation towers on main course.
  - Develop new one-acre "Helice" Shooting Range, separate from existing sporting clays, and overlaid on an existing field.
  - Bunker Trap field.

#### *New Sporting Clays Courses*

- Develop two new 10-station Sporting Clays courses north of the existing Trap and Skeet fields. These courses will allow BACTC to accommodate national and international competitive events as well as generate additional revenue for the entire BASF.
- Develop a lighted executive 10-station Sporting Clays course with dedicated parking located to the west of the intersection at Calle Silhouetta and Archery Roads.
- Detailed design considerations for the BACTC include the following:
  - Availability to rent golf carts.
  - Parking areas for golf carts.
  - Additional shade structures and restrooms throughout Sporting Clays courses.
  - Maintenance of Sporting Clays pathways for cart and pedestrian uses.

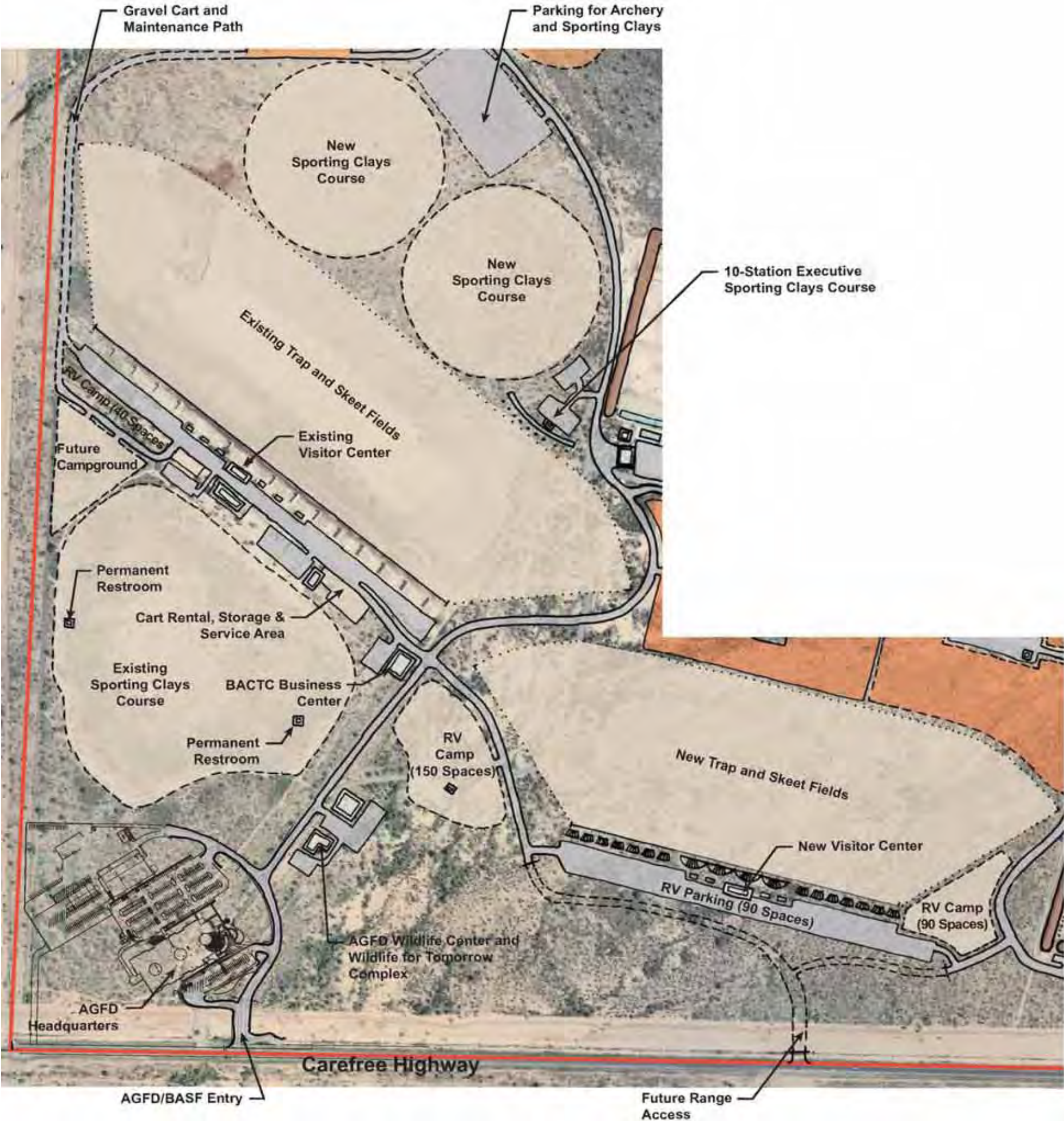


Figure 19. Ben Avery Clay Target Center and AGFD Headquarters

- Developing permanent restrooms along the existing Sporting Clays course.
- Develop two RV camp areas totaling 240 spaces that may combine dry and full hook-up sites.
- Develop a gravel cart and maintenance path from the existing Trap and Skeet fields along the western boundary of BASF, connecting to the Sporting Clays courses and Archery Road.

### **8.2.6 Archery**

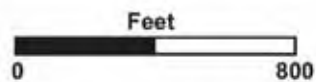
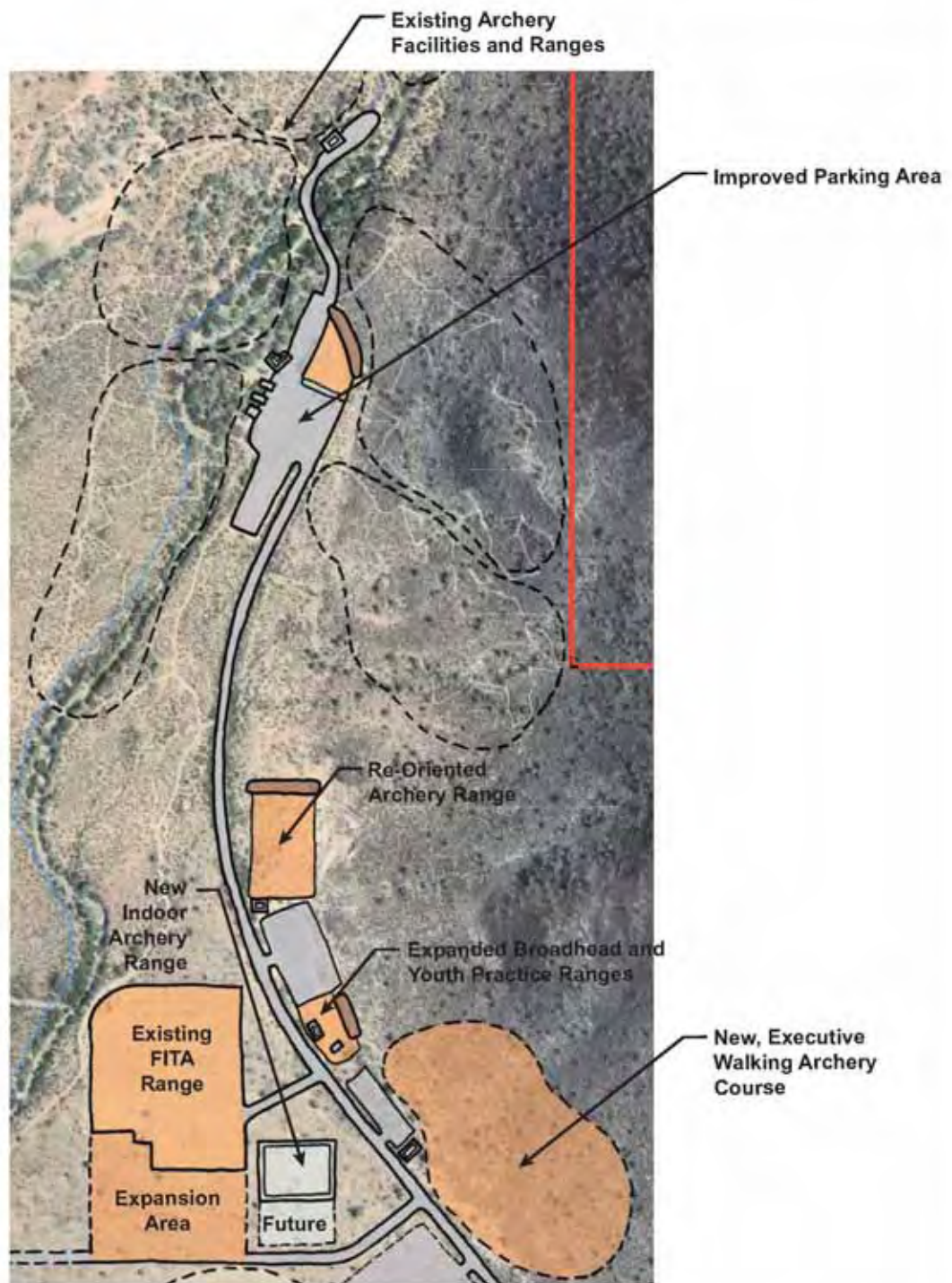
Figure 20, *Archery Ranges*, illustrates the conceptual configuration of this area. AGFD is committed to continued participation with user groups during the detailed design and development of individual program elements. This will further enhance Archery Ranges at BASF and ensure the development of a world-class facility by providing additional guidance, additional range innovations, up-to-date safety standards, and best management practices. The following are the Archery Range improvements proposed in the Final Master Plan.

#### *Existing FITA Range and Expansion Area*

- Provide a full build-out of proposed FITA Range expansion to accommodate national and international archery events. Improvements would consist of expanding the parking area, developing permanent shade structures, and developing an Indoor Archery Range and administration building, with future expansion to include an education building.
- Additional detailed design considerations for FITA Range and Expansion Area are as follows:
  - Stabilization of west bank of wash with stone armoring.
  - Permanent lighting structures for evening archery events.

#### *Additional Archery Improvements*

- Expand Broadhead and Youth Practice Ranges
- Develop new executive walking Archery course with dedicated parking and a combined Range Safety Officer and storage building.
- Reorient the three-dimensional target Archery Range.
- Improve existing parking area with paving and striping.
- Additional detailed design considerations for the Archery Ranges include the following:
  - Develop retail/office space at archery area.
  - Provide lighting for range and target areas.
  - Develop waterproofing shade structures.
  - Develop public address system and “hot range” lights.
  - Provide timer or course clock system.
  - Improve target quality to reduce damage to user equipment.
  - Permanent restrooms and drinking fountains.



**Figure 20. Archery Ranges**

### **8.2.7 Management and Operations**

Further recommendations based on management, operations, and programming suggestions from AGFD staff and user and focus groups and on site-analysis information are not specifically shown in the BASF Master Plan. These other recommendations are intended as discussion points for fine-tuning the BASF Master Plan to help achieve the VGOs identified in Section 5.0. These additional recommendations include the following:

- Preserve habitat in high-value areas and improving habitat in medium-value areas. BASF can retain most of its high-value areas simply by keeping them undeveloped and by keeping BASF users in designated areas and on designated trails.
- Prevent random access and “wildcat” trails into currently unmarked areas to minimize habitat disturbances. High-value areas, such as the northwest Archery Range wash that transects BASF, should be preserved as much as possible because of its value as a wildlife movement corridor.
- Preserve Biscuit Tank and the grove of trees surrounding it, since it provides water, forage, and cover for the local wildlife.
- Preserve high-value washes either by limiting access along the roads or by placing wildlife crossings at the intersection of roads and washes.
- Expand hours of operations to reduce scheduling conflicts and to take advantage of cooler night temperatures during the summer months.
- Supply key-coded entry access with unique codes for each group to prevent issues surrounding gate closures during off-hours and scheduled events.
- Increase the number of Range Safety Officers at all active ranges through user group volunteers and AGFD staff.
- Coordinate emergency preparedness planning, such as creating a wildfire protection plan with City of Phoenix Fire Department.
- Establish new reservation system and fee schedule to include scheduling and rental fees for BASF Master Plan amenities such as RV sites, equipment rentals, and meeting space.
- Incorporate green building principles in facility improvements.
- Incorporate and seek out new ways of attracting revenue, such as new marketing strategies, retail pro shop, restaurant, shooting lessons, and range rentals.

## 9.0 FUNDING AND IMPLEMENTATION

### 9.1 Introduction

The BASF Master Plan does not identify a timeline or dedicated budget for completing range developments and improvements. Prioritization of the recommended range developments and improvements will be based on the criteria of safety, demand, opportunities, and available budget.

Opportunities include partnerships with outside entities or user groups that wish to provide funds or other resources for the development of specific components of the master plan.

The BASF Master Plan is intended to be a “living” document that is updated and refined through time. Funding sources along with the Master Plan will be revisited every five years to identify new funding alternatives, and reevaluate existing funding sources.

### 9.2 Potential Funding Sources

An identification and evaluation of funding alternatives and methods for implementation of recommendations was conducted as part of the master planning process. The potential and existing types of funding sources are as follows:

- Competitive Grants
- Donations/Gifts/Volunteer Work
- BASF Range Revenues including User Fees
- BASF Range Fund
- Foundations
- Inter-Governmental Agreements
- SAFETEA-LU (for enhancements of entryways and multi-modal transportation opportunities)
- Other Eligible Department Funding Sources (as recommended during the Department's biannual budget package process and approved by the Arizona Game and Fish Commission)

Improvements and upgrades identified in the BASF Master Plan can also be funded through a variety of partnerships with public and private entities, manufacturers, and other organizations. Because of the relative scarcity of public shooting facilities, specific funding strategies geared toward public shooting ranges remain largely undefined. However, because the BASF is a multi-use facility, individual components of the BASF Master Plan may be funded through specific funding sources.

## **Appendix A.     Biological Resources Information**

# **Biological Resource Overview**

for

## **Ben Avery Shooting Facility Master Plan**

**Prepared for**



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October 2007

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Appendix A. Wildlife species potentially occurring in the planning area

# BEN AVERY SHOOTING FACILITY MASTER PLAN

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## Introduction

The Ben Avery Shooting Facility (BASF), located in northwest Phoenix, is an approximately 1,650-acre facility that was built in the late 1950's and is currently operated by the Arizona Game and Fish Department (Figure 1). Existing facilities at BASF include 35 different ranges serving a variety of gun users and gun types as well as competitive and recreational archery facilities, a campground, and classrooms for facility users. The Arizona Game and Fish Department is undertaking a public master plan process in order to plan for the future recreational needs at BASF and has contracted Logan Simpson Design Inc. to complete a Facility Master Plan that will identify plans for future development within the planning area.

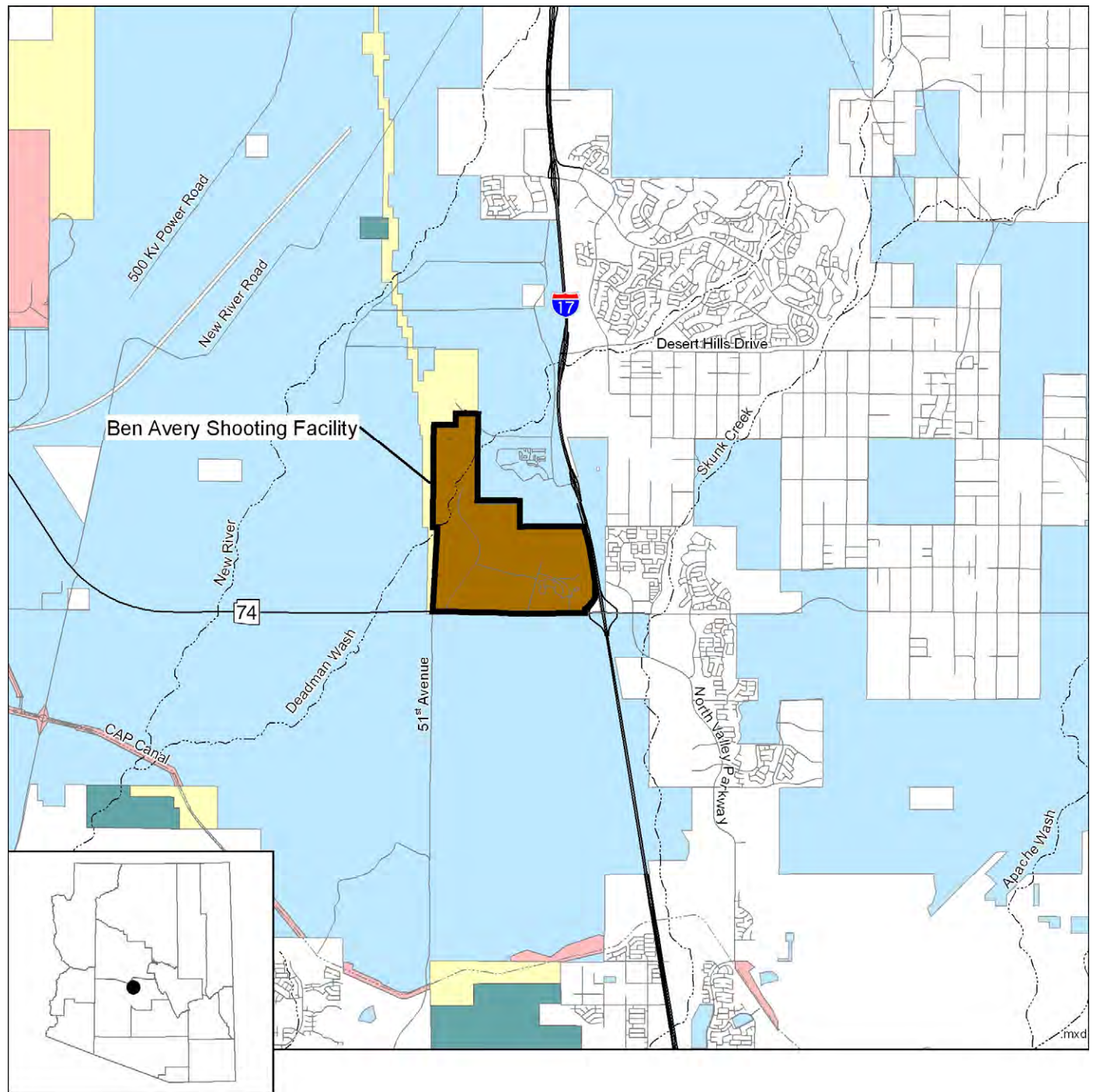
The purpose of this biological resource overview is to identify the range of biological resources within the planning area so that these resources can be considered during the process of siting various administrative and recreational facilities within BASF. This overview documents the ecological setting within the planning area, provides a qualitative assessment of habitat values within the planning area, and identifies plant and animal species—including special status species—that are likely to occur within the planning area.

## Ecological Setting

The planning area is located within the Basin and Range Physiographic Province of central Arizona, which is characterized by low desert valleys and plains surrounded by fault-block mountain ranges. Elevations within the planning area range from 1,600 to 2,165 feet above mean sea level. The planning area includes the westernmost portion of a small range of low-lying basalt hills; most of the shooting range facilities are in a relatively flat area at the base of these hills. The New River is approximately 2 miles to the east of the planning area. Only one major wash, Deadman Wash, occurs in the planning area, which cuts across its northwest corner and directs storm flows southwest towards the New River.

The planning area occurs within the Arizona Uplands subdivision of the Sonoran Desertscrub biotic community, which is characterized by high temperatures and generally low precipitation (Turner and Brown 1994). Approximately half of the planning area is currently developed; the rocky slopes of a basalt hill constrain development in the northeastern portion of the planning area. The Interstate 17 transportation corridor is immediately to the east and a state correctional facility is present to the north of the planning area. Commercial and residential developments are present to the east of I-17, while lands to the south and west of the planning area are undeveloped.

# BEN AVERY SHOOTING FACILITY MASTER PLAN



## Key

	BASF boundary		Bureau of Land Management
	Arizona Game and Fish		Bureau of Reclamation
	State Trust		County Land
	Private		

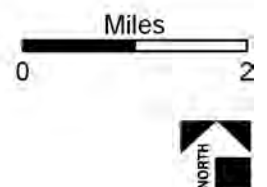


Figure 1. Planning area

### Vegetation and Wildlife

The Arizona Uplands are wetter, lusher, and typically more diverse than the lower elevation desert scrub found on valley floors in central and southwestern Arizona. Vegetation within undeveloped portions of the planning area is typical of the palo verde-cacti-mixed shrub series. This vegetation association is characterized in the planning area by a combination of palo verde (*Cercidium* spp.), ironwood (*Olneya tesota*), and mesquite (*Prosopis* spp.) trees; ocotillo (*Fouqueria splendens*); saguaro (*Carnegiea gigantea*), cholla (*Opuntia* spp.), barrel (*Ferocactus* spp.), and hedgehog (*Echinocereus* spp.) cacti; and creosote (*Larrea tridentata*), bursage (*Ambrosia* spp.), and a variety of other shrubs. Teddy bear cholla (*Opuntia bigelovii*) is dominant on the lower slopes of the basalt hill and forms dense stands in other portions of the planning area. The dominant species in washes are palo verde and mesquite, while creosote and triangle-leaf bursage (*Ambrosia deltoidea*) are more dominant in upland areas. Along drainages, vegetation is denser and also includes species such as desert hackberry (*Celtis pallida*) and wolfberry (*Lycium* sp.). Developed portions of the planning area typically have a bare ground or gravel surface with scattered mesquite, palo verde, and ironwood trees and various cacti as landscaping along paths and in front of buildings.

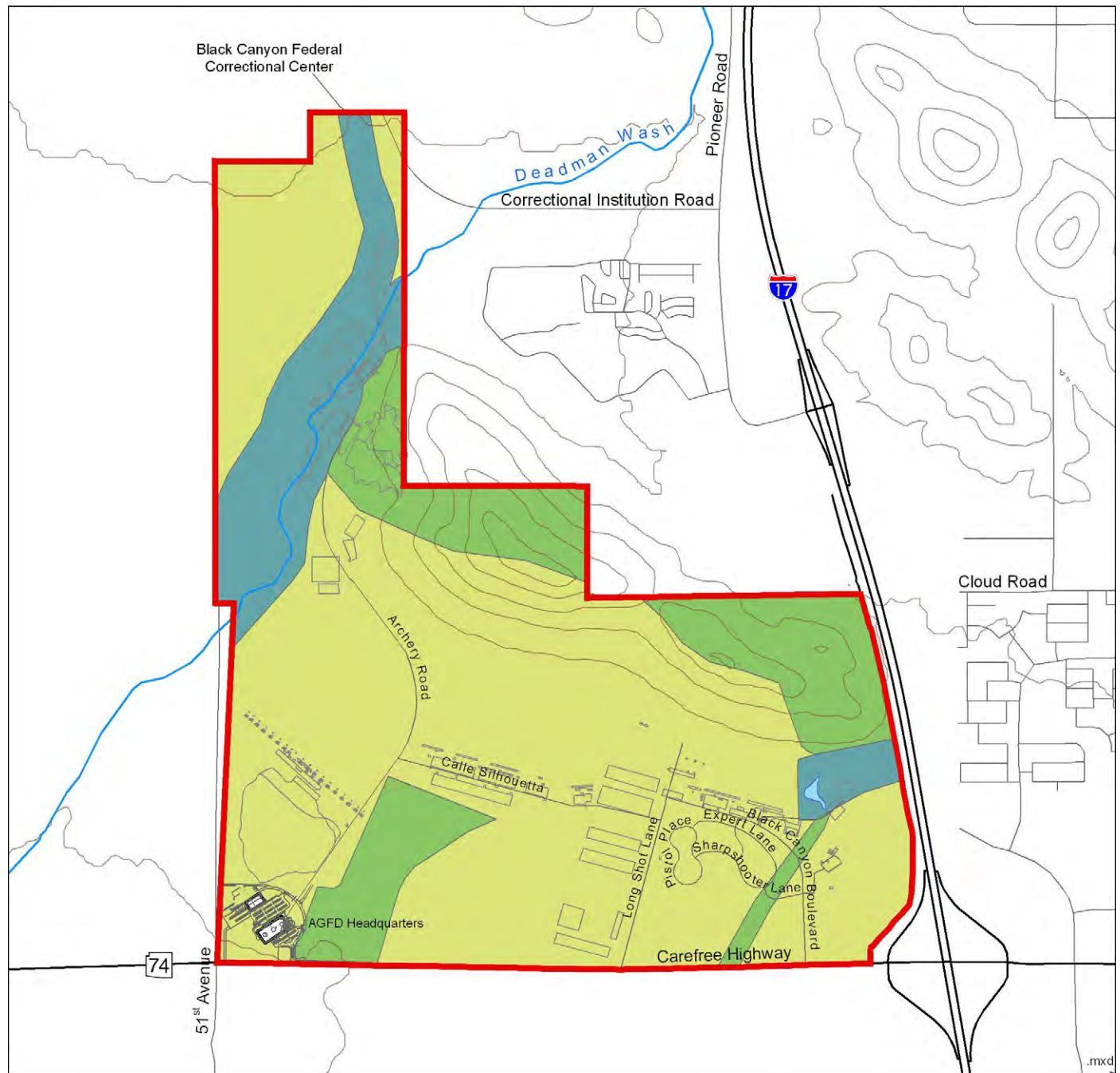
Undeveloped lands to the south and to the west of the planning area are prime habitats for native desert wildlife and provide a degree of connectivity between habitats within the planning area and larger blocks of habitat outside the planning area. The undeveloped portions of the planning area provide natural habitats for wildlife; rocky slopes and xeroriparian corridors along dry washes provide microhabitats and additional structural complexity within the planning area. Birds such as the black-throated sparrow (*Amphispiza bilineata*), curve-billed thrasher (*Toxostoma curvirostre*), Inca dove (*Columbina inca*), ladder-backed woodpecker (*Picoides scalaris*) and Gambel's quail (*Callipepla gambelii*) were some of the more commonly observed wildlife at BASF. Other common species that might be seen in the planning area include coyotes (*Canis latrans*), wood rats (*Neotoma* spp.), desert cottontails (*Sylvilagus auduboni*), cactus wrens (*Campylorhynchus brunneicapillus*), roadrunners (*Geococcyx californianus*), and common side-blotched lizards (*Uta stansburiana*). Signs of small burrowing mammals, possibly Merriam's kangaroo rats (*Dipodomys merriami*) and cactus mice (*Peromyscus eremicus*), were evident in the planning area. Food sources for foraging bats are available throughout the planning area, although few, if any, natural roost sites are present. Wildlife species that are common in the Sonoran Desert and that may be seen in the planning area are listed in Appendix A.

### Habitat Values

Relative habitat values of “high”, “medium”, and “low” have been assigned to the planning area based on their levels of existing development and disturbance, extent of native vegetation, and degree of habitat connectivity (Figure 2). These assigned values reflect the natural juxtaposition of various habitat types and the presence of adjacent higher-valued habitats or degraded areas.

A determination of “high” value is assigned to those areas where the native vegetation community is intact, mature vegetation or topography provides structural complexity and varied microhabitats, and/or the area supports a high diversity or density of wildlife species. The xeroriparian corridor along Deadman Wash and one of its tributaries was considered to have a high habitat value. Biscuit Tank also rated a high habitat value because it provides water and cover for wildlife. “Medium” value areas within the planning area may occur in proximity to developed areas, but provide mature vegetation, connectivity to other habitats, or structural complexity that is not available in lower value habitats. Two smaller wash corridors and the rocky slopes of hills in the planning area were considered to be of medium habitat value. “Low” value areas have limited or no native vegetation and receive a high level of use by humans. The developed portions of the planning area were considered to have a relatively low habitat value, although the use of native vegetation in landscaping provides some habitat for species that are more tolerant of human disturbance.

# BEN AVERY SHOOTING FACILITY MASTER PLAN



## Key

- BASF boundary
- High habitat value
- Medium habitat value
- Low habitat value

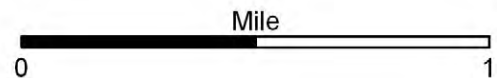


Figure 2. Habitat values

Biological Resource Overview

# BEN AVERY SHOOTING FACILITY MASTER PLAN

## Special Status Species in the Planning Area

The term special status species in this overview refers to species that are listed under the federal Endangered Species Act of 1973 (16 United States Code 1531–1544, as amended), as well as species that are not protected under the Endangered Species Act but have been given special status designations by state and federal agencies to allow for active management of those species.

### Threatened and Endangered Species

A list of threatened, endangered, proposed, and candidate species for Maricopa County was obtained from the US Fish and Wildlife Service. A review of the list revealed the absence of suitable habitat for any threatened or endangered species within the planning area, as indicated below in Table 1.

**Table 1.** US Fish and Wildlife Service list of threatened, endangered, proposed, and candidate species occurring in Maricopa County

Species name	Status <sup>a</sup>	Habitat requirements	Suitable habitat present?
<b>Plants</b>			
Arizona cliffrose ( <i>Purshia subintegra</i> )	ESA LE	White soils of tertiary limestone lakebed deposits below 4,000 feet.	No suitable habitat present
<b>Fish</b>			
Desert pupfish ( <i>Cyprinodon macularius</i> )	ESA LE WSCA	Shallow springs, small streams, and marshes below 5,000 feet.	No suitable habitat present
Gila chub ( <i>Gila intermedia</i> )	ESA LE WSCA	Pools, springs, cienegas, and streams of the Gila River Basin from 2,000 to 5,500 feet.	No suitable habitat present
Gila topminnow ( <i>Poeciliopsis occidentalis occidentalis</i> )	ESA LE WSCA	Small streams, springs, and cienegas in vegetated shallows below 4,500 feet.	No suitable habitat present
Razorback sucker ( <i>Xyrauchen texanus</i> )	ESA LE WSCA	Riverine and lacustrine areas of the Colorado River and its tributaries below 6,000 feet.	No suitable habitat present
<b>Birds</b>			
California brown pelican ( <i>Pelecanus occidentalis californicus</i> )	ESA LE	Transient to the lower Colorado River and large bodies of water in central Arizona at various elevations.	No suitable habitat present
Mexican spotted owl ( <i>Strix occidentalis lucida</i> )	ESA LT WSCA	Statewide in old growth mixed-conifer and pine-oak forests on steep slopes and canyons from 3,700 to 10,000 feet.	No suitable habitat present
Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> )	ESA LE WSCA	Dense riparian vegetation near a permanent or nearly permanent source of water or saturated soil from sea level to 8,500 feet.	No suitable habitat present
Yellow-billed cuckoo ( <i>Coccyzus americanus</i> )	ESA C WSCA	Large blocks of riparian habitat below 6,500 feet.	No suitable habitat present

## BEN AVERY SHOOTING FACILITY MASTER PLAN

**Table 1.** US Fish and Wildlife Service list of threatened, endangered, proposed, and candidate species occurring in Maricopa County (continued)

Species name	Status <sup>a</sup>	Habitat requirements	Suitable habitat present?
<b>Birds (continued)</b>			
Yuma clapper rail ( <i>Rallus longirostris yumanensis</i> )	ESA LE WSCA	Fresh and brackish marshes with dense emergent vegetation and wet substrates along the Lower Colorado River and its tributaries below 4,500 feet	No suitable habitat present
<b>Mammals</b>			
Lesser long-nosed bat ( <i>Leptonycteris curasoae yerbabuenae</i> )	ESA LE	Desert grassland and scrubland up to oak transition areas with columnar cacti or agave below 6,000 feet	Planning area is outside species' range
Sonoran pronghorn ( <i>Antilocapra americana sonoriensis</i> )	ESA LE WSCA	Arizona Upland and Lower Colorado River Valley Sonoran Desertscrub in broad alluvial valleys south of Interstate 8 from the western boundary of the Cabeza Prieta Wildlife Refuge east to State Route 85	Planning area is outside species' range

Source: US Fish and Wildlife Service list of threatened, endangered, and candidate species potentially occurring in Maricopa County, <<http://arizonaes.fws.gov/>>. Accessed October 15, 2007.

<sup>a</sup> Status definitions: WSCA=Wildlife of Special Concern in Arizona, ESA=Endangered Species Act, LE=Listed Endangered, LT=Listed Threatened, C=Candidate

### Critical Habitat

Critical habitat that has been designated or proposed by the US Fish and Wildlife Service for the conservation of threatened and endangered species receives special legal protection under the Endangered Species Act. A review of the planning area revealed the absence of designated or proposed critical habitats for any threatened or endangered species.

### Other Special Status Species

A query of the Arizona Game and Fish Department's Heritage Database Management System through the Department's On-line Environmental Review Tool revealed that the Department has not documented the presence of any special status species within the planning area, although special status species may occur in the planning area that have not yet been documented.

## Recommendations

Preserving and enhancing existing habitats within the planning area could be one of the Arizona Game and Fish Department's goals in planning and developing the BASF. For example, well-marked paths help to prevent disturbance to existing vegetation. Much of the planning area can maintain its value for wildlife

## BEN AVERY SHOOTING FACILITY MASTER PLAN

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simply by preserving existing vegetation. Wildlife habitats in the planning area could also be enhanced through efforts to control noxious and invasive species and restore native vegetation and habitats, where possible.

### References

- Arizona Game and Fish Department. 1996 (in prep). *Wildlife of Special Concern in Arizona*. Arizona Game and Fish Department. Phoenix.
- Turner, R. M. and D. E. Brown. 1994. "Sonoran Desertscrub." In *Biotic Communities: Southwestern United States and Northwestern Mexico*, edited by D. E. Brown, 180–221. University of Utah Press, Salt Lake City.

## **Appendix A**

### **Wildlife Species Potentially Occurring in the Planning Area**

## BEN AVERY SHOOTING FACILITY MASTER PLAN

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### Birds

White-winged dove  
*Zenaida asiatica*

Mourning dove  
*Zenaida macroura*

Rock dove  
*Columba livia*

Inca dove  
*Columbina inca*

Greater roadrunner  
*Geococcyx californianus*

Lesser nighthawk  
*Chordeiles acutipennis*

Common poorwill  
*Phalaenoptilus nuttallii*

Abert's towhee  
*Pipilo aberti*

Gila woodpecker  
*Melanerpes uropygialis*

Ladder-backed woodpecker  
*Picoides scalaris*

Gilded flicker  
*Colaptes chrysoides*

Say's phoebe  
*Sayornis saya*

Western kingbird  
*Tyrannus verticalis*

Verdin  
*Auriparus flaviceps*

Cactus wren  
*Campylorhynchus brunneicapillus*

Rock wren  
*Salpinctes obsoletus*

Black-tailed gnatcatcher  
*Poliophtila melanura*

Northern mockingbird  
*Mimus polyglottos*

Curve-billed thrasher  
*Toxostoma curvirostre*

Bendire's thrasher  
*Toxostoma bendirei*

Loggerhead shrike  
*Lanius ludovicianus*

Northern cardinal  
*Cardinalis cardinalis*

Black-throated sparrow  
*Amphospiza bilineata*

House sparrow  
*Passer domesticus*

House finch  
*Carpodacus mexicanus*

Brown-headed cowbird  
*Molothrus ater*

Great-tailed grackle  
*Quiscalus mexicanus*

Western meadowlark  
*Sturnella neglecta*

Horned lark  
*Eremophila alpestris*

Gambel's quail  
*Callipepla gambelii*

Ash-throated flycatcher  
*Myiarchus cinerascens*

Brown-crested flycatcher  
*Myiarchus tyrannulus*

Lucy's warbler  
*Vermivora luciae*

Costa's hummingbird  
*Calypte costae*

Anna's hummingbird  
*Calypte anna*

Black-chinned hummingbird  
*Archilochus alexandri*

Northern rough-winged swallow  
*Stelgidopteryx serripennis*

Cliff swallow  
*Petrochelidon pyrrhonota*

Cooper's hawk  
*Accipiter cooperii*

Harris' hawk  
*Parabuteo unicinctus*

Red-tailed hawk  
*Buteo jamaicensis*

American kestrel  
*Falco sparverius*

Western screech-owl  
*Asio kennicottii*

Great horned owl  
*Bubo virginianus*

Burrowing owl  
*Athene cunicularia*

Elf owl  
*Micrathene whitneyi*

Barn owl  
*Tyto alba*

Common raven  
*Corvus corax*

Turkey vulture  
*Cathartes aura*

# BEN AVERY SHOOTING FACILITY MASTER PLAN

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## Reptiles and Amphibians

Desert iguana <i>Dipsosaurus dorsalis</i>	Spotted leaf-nosed snake <i>Phyllorhynchus decurtatus</i>
Common chuckwalla <i>Sauromalus obesus</i>	Coachwhip <i>Masticophis flagellum</i>
Zebra-tailed lizard <i>Callisaurus draconoides</i>	Western patch-nosed snake <i>Salvadora hexalepsis</i>
Long-nosed leopard lizard <i>Crotophytus wislizenii</i>	Gophersnake <i>Pituophis melano-leucus</i>
Desert spiny lizard <i>Sceloporus magister</i>	Common kingsnake <i>Lampropeltis getulus</i>
Ornate tree lizard <i>Urosaurus ornatus</i>	Western ground snake <i>Sonora semiannulata</i>
Brush lizard <i>Urosaurus graciosus</i>	Western shovel-nosed snake <i>Chionactis occipitalis</i>
Common side-blotched lizard <i>Uta stansburiana</i>	Western diamond-back rattlesnake <i>Crotalus atrox</i>
Desert horned lizard <i>Phrynosoma platyrhinos</i>	Black-tailed rattlesnake <i>Crotalus molossus</i>
Regal horned lizard <i>Phrynosoma solare</i>	Mohave rattlesnake <i>Crotalus scutulatus</i>
Tiger whiptail lizard <i>Aspidoscelis tigris</i>	Tiger rattlesnake <i>Crotalus tigris</i>
Gila monster <i>Heloderma suspectum</i>	Speckled rattlesnake <i>Crotalus mitchellii</i>
Western banded gecko <i>Coleonyx variegatus</i>	Sidewinder <i>Crotalus cerastes</i>
Sonoran desert toad <i>Bufo alvarius</i>	Variable sandsnake <i>Chilomeniscus stramineus</i>
Western lyresnake <i>Trimorphodon biscutatus</i>	Sonoran coralsnake <i>Micruroides euryxanthus</i>
Groundsnake <i>Sonora semiannulata</i>	Long-nosed snake <i>Rhinocheilus lecontei</i>
Nightsnake <i>Hypsiglena torquata</i>	Ring-necked snake <i>Diadophis punctatus</i>
Glossy snake <i>Arizona elegans</i>	

## BEN AVERY SHOOTING FACILITY MASTER PLAN

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### Mammals

Coyote <i>Canis latrans</i>	Cactus mouse <i>Peromyscus eremicus</i>
Kit fox <i>Vulpes macrotis</i>	Botta's pocket gopher <i>Thomomys bottae</i>
Gray fox <i>Urocyon cinereoargenteus</i>	Arizona pocket mouse <i>Perognathus amplus</i>
Bobcat <i>Lynx rufus</i>	Arizona cotton rat <i>Sigmodon arizonae</i>
Badger <i>Taxidea taxus</i>	Southern grasshopper mouse <i>Onychomys torridus</i>
Desert cottontail <i>Sylvilagus audubonii</i>	California-leaf nosed bat <i>Macrotus californicus</i>
Black-tailed jackrabbit <i>Lepus californicus</i>	Western pipistrelle <i>Pipistrellus hesperus</i>
Rock squirrel <i>Spermophilus variegatus</i>	Cave myotis <i>Myotis velifer</i>
Harris' antelope squirrel <i>Ammospermophilus harrisi</i>	Pocketed free-tailed bat <i>Nyctinomops femorosaccus</i>
Round-tailed ground squirrel <i>Spermophilus tereticaudus</i>	Mexican free-tailed bat <i>Tadarida brasiliensis</i>
White-throated wood rat <i>Neotoma albigula</i>	Pallid bat <i>Antrozous pallidus</i>
Desert wood rat <i>Neotoma lepida</i>	Western mastiff bat <i>Eumops perotis</i>
Merriam's kangaroo rat <i>Dipodomys merriami</i>	

## **Appendix B.     Soils and Geological Resources**

## SOILS AND GEOLOGICAL RESOURCES

### B-1. Introduction

An evaluation of the soils, slopes, and landforms for the BASF Master Plan was undertaken to determine erosion risk areas and locations suitable for development. The soils evaluation involved archival research using available National Resources Conservation Service (NRCS) soil survey reports, the SSURGO database, the NRCS web soil survey, and the official soil series descriptions to identify and qualitatively describe the land use suitability and erosion risk associated with the soils in BASF (Camp, 1986). In addition to land use suitability and erosion risk assessment, the soil evaluation was used to identify distinct landform assemblages and describe their degree of stability and suitability for the location of future facilities.

The study was designed to provide an overview of soil conditions and to identify erosion risks for broad areas. It is anticipated that additional, site-specific testing will be required for any construction within the Ben Avery Shooting Facility.

### B-2. Methodology

The evaluation of soil erosion risk used here is a qualitative approach using the NRCS soil survey reports and soil series descriptions to obtain and evaluate factors involved in erosion dynamics as well as other factors that may affect development of the area such as shrink swell potential (NRCS 2006). These main factors were used for the qualitative assessment of soil erosion risk:

**Slope** – the percent slope is the most important factor affecting a soil's susceptibility to erosion.

**Soil/Geology** – the soil type and geology of an area determines the soil texture, permeability, and soil depth.

**Runoff/Erodibility** – runoff refers to the speed at which water pools and flows over the soil surface. Erodibility refers to the resistance of the soil to erosion.

**Shrink Swell Potential** – shrink swell potential refers to the tendency for some soils high in clay to expand and contract.

The first three factors interact with each other in ways that affect the overall soil erosion risk. Additional factors that can influence the magnitude of this risk are the extent and type of vegetation cover, the slope aspect, and adjacent land uses. These also interact with each other and with the three main factors. The fourth factor Shrink Swell Potential has little to do with erosion but can cause extensive complications when developing an area.

Each of the factors described above is assessed for each of the soils found within BASF and is summarized below.

### B-3. Erosion and Shrink Swell Potential

The soil erosion risk and the shrink swell Potential for BASF is depicted in Table B-1, *Erosion Risk and Shrink Swell Potential Summary* and Figure 2, *Soils*, located in the main document. Erosion risk is categorized as slight, moderate, and high. In general, areas of higher risk are located on steep slopes with less permeable and/or shallow soils. Within the BASF area the overall erosion risk is low or moderate.

The Shrink Swell Potential is categorized as slight, slight to moderate, moderate, moderate to high, and high. The areas with the higher potential for shrink swell soils are located on the flats and comprise the majority of the area.

## **B-4. Soil/Landform Grouping**

In addition to erosion risk and shrink swell potential assessments, the soils were used to identify distinct soil/landform assemblages and describe their degree of stability and suitability for the location of future park facilities, (refer to Table B-1). BASF consists of three general soil/landform groupings or geomorphic surfaces: hill slopes, stream channels/floodplains, and Pleistocene fan terraces (Figure 2).

- The hill slope geomorphic surfaces in BASF are erosional landforms with thin soil on top of bedrock. These areas are the most susceptible to erosion, and special consideration must be taken to prevent soil loss.
- The stream channel/floodplain geomorphic surfaces in BASF are associated with Deadman Wash that consists of recently deposited sediment overlying much older Pleistocene fan terrace deposits. These areas are generally stable but are subject to periodic flooding, bank erosion, and wind erosion.
- The Pleistocene fan terrace geomorphic surfaces in BASF are stable areas no longer exposed to regular flooding and aggradation. These areas often have relatively impermeable soil layers (argillic clay horizons, duripans).

## **B-5. Soil Analysis**

There are large areas of BASF that fall under the hill slope soil/landform grouping (Figure 2). These areas are highly sensitive to erosion, are inherently fragile, and should be excluded from consideration when selecting sites for park facilities; furthermore, the placement of trails should be considered carefully to prevent erosion and gullyng.

The stream channel/floodplain geomorphic surfaces make up only a small portion of the BASF and are located within and along Deadman Wash (Figure 2). The stream channel/floodplain grouping should be carefully evaluated when considering sites for any park facilities. These areas are subject to occasional flooding and lateral channel erosion. The on-site soils should provide adequate support for normal building foundations, although more detailed and site-specific evaluations should be conducted before any construction. Trails may be suitable on this landform grouping, but they may need regular maintenance because of the occasional flooding.

The Pleistocene fan terrace geomorphic surfaces occupy a large area (Figure 2). This soil/landform grouping has a high potential for containing shrink swell soils that could adversely affect any buildings of facilities. Special care should be taken to maintain constant moisture content in the soil. Runoff should be diverted away buildings in addition landscaping around buildings should be restricted to plants that require little water. The affects of shrink swell soils on buildings and paved roads can be minimized by the use of appropriate engineering design. The Pleistocene terrace soil/landform grouping is suitable for trails, picnic areas and other range improvements that do not require the construction of freestanding buildings or paved surfaces.

The Pleistocene fan terrace geomorphic surfaces surrounds the hill slope geomorphic surfaces and is characterized by deep, well-drained, shrink swell soils that are may be suitable for the location of most types of park facilities given appropriate consideration to the type of facility and the effects that shrink swell soils may have on that facility (Figure 2). A more detailed and site-specific evaluations should be conducted before any construction.

**Table B–1. Erosion Risk Summary**

Soil name	Percent Slope	Depth to Impermeable Layer	Runoff	Texture	Geomorphic Surfaces	Erosion Risk	Shrink Swell Potential
Carefree Cobbly Clay Loam	1 to 8	> 60 inches	Slow to medium	Cobbly clay loam	Pleistocene fan terraces	Slight	High
Tremant Gravely Sandy Loam	0 to 3	> 60 inches	Slow	Gravely sandy loam	Shallow wash channel and flood plain	Slight	Low to moderate
Suncity-Cipriano complex	1 to 7	9 inches to duripan	Slow to medium	Gravely clay loam	Pleistocene fan terraces	Slight	Low to moderate
Cherioni-Rock outcrop complex	5 to 60	< 13 inches to bedrock	Medium to rapid	Extremely stony loam	Hill slopes	Moderate	Low
Pinamt-Tremant complex	1 to 10	> 60 inches	Slow	Gravely sandy loam	Pleistocene fan terraces	Slight	Low

Source: Hartman, 1977; Soil Survey Division, Natural Resources Conservation Service, United States Department of Agriculture, and n.d. Official Soil Series Descriptions [Online WWW]. Available URL: < <http://ortho.ftw.nrcs.usda.gov/osd/> > [Accessed 18 Dec 2006].

## B–6. Geology Overview

The geology of the bedrock hills within BASF contains latest Oligocene to Middle Miocene basalts which are part of the Chalk Canyon formation (15.4 to 23.3 mya) (Leighty and Huckleberry 1998). Overlying this basalt on the ridgelines of the hills are interbedded tuff and sedimentary deposits ranging in age from the early to middle Miocene.

The hills in BASF have large areas of exposed rock near their summits. As one moves downslope, overlying sediments become thicker and forms a colluvial or talus fan. These colluvial fans are composed of a mixture of materials eroded from the steeper hill slopes above and form a transition from the steep exposed bedrock hills of BASF and the gradually sloping Pleistocene fan terraces that surround BASF. These colluvial fans cover portions of the Pleistocene fan terraces that compose most of the area. The ages of the Pleistocene fan terraces, are thought to have formed somewhere between 400,000 to 750,000 years ago (Leighty and Huckleberry 1998). Cutting through this ancient landscape is Deadman Wash and its associated alluvial deposits. These deposits along with the wash are Holocene in age (< 10,000 years ago). The geology and landforms within the BASF contains remnant portions of ancient landscapes including volcanic basalt flows, ancient lake deposits and a Pleistocene aged surface dissected by Holocene washes and covered in parts by Holocene alluvium.

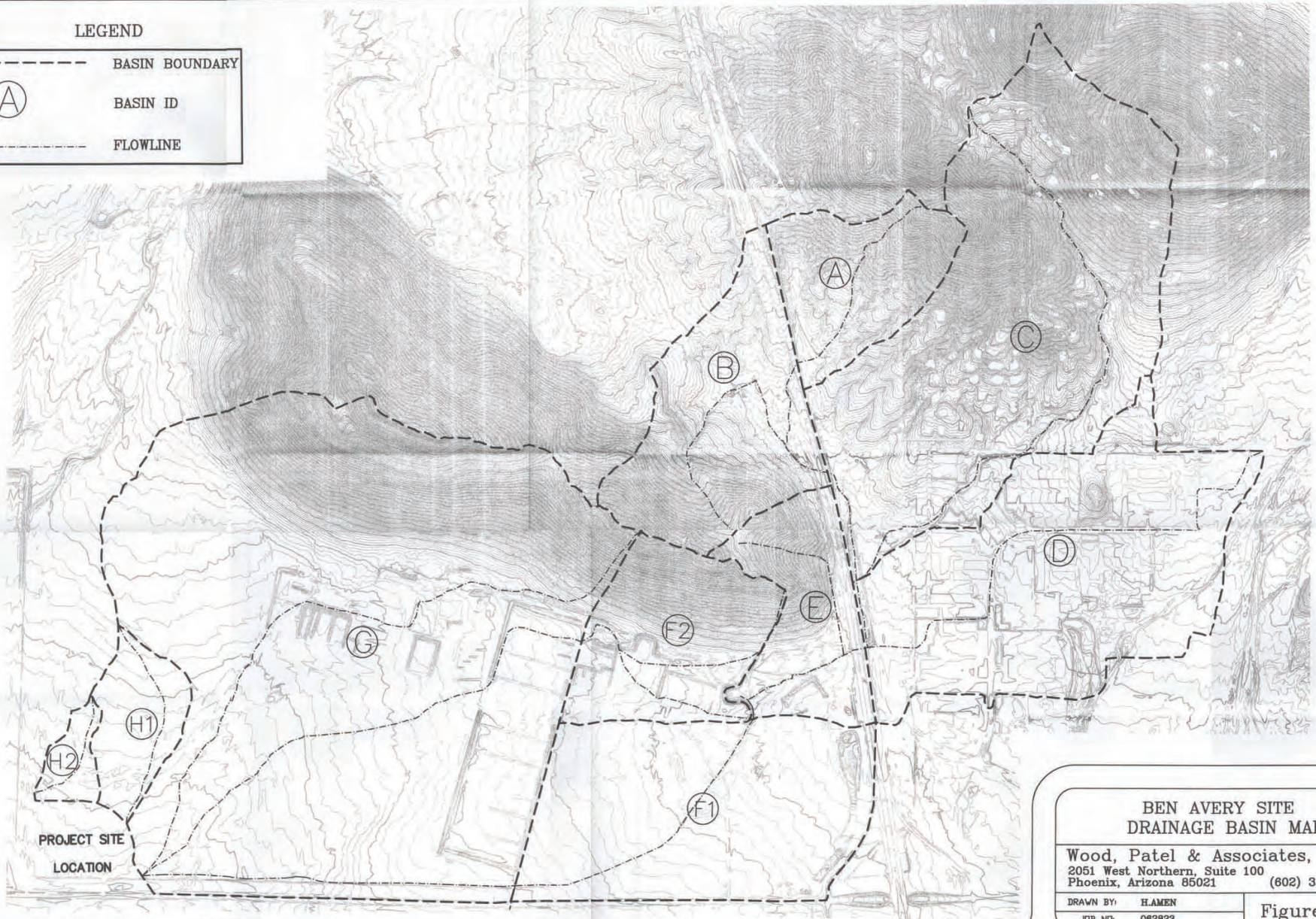
## Soils, Slope, and Geological References

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## **Appendix C.      AGFD Drainage Basin Map from Ben Avery Site Drainage Report**

# LEGEND

---	BASIN BOUNDARY
Ⓐ	BASIN ID
---	FLOWLINE



## BEN AVERY SITE DRAINAGE BASIN MAP

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DRAWN BY: HAMEN  
JOB NO: 062823

Figure 1.1

**Appendix D. Existing Structures/Facilities Evaluation List**

**Table D-1. Existing Structure Analysis**

Structure Inventory		General Information			Future Potential			
Code	Structure	S.F.	Cond.	Material	ADA Access	Remain /Rehab	Remove	Adapt
0010	Maintenance Building	864	F	W	N/A	X		
0020	Maintenance Shed	180	F/P	W	N/A		X	
0030-A	Maintenance Storage Shed 1	2,123	F	W	N/A		X	
0030-B	Maintenance Storage Shed 2	2,123	F	W	N/A		X	
0030-C	Maintenance Storage Shed 3	2,123	F	W	N/A		X	
0030-D	Maintenance Storage Shed 4	2,123	F	W	N/A		X	
0030-E	Maintenance Storage Shed 5	2,123	F	W	N/A		X	
0030-F	Maintenance Storage Shed 6	2,123	F	W	N/A		X	
0030-G	Maintenance Storage Shed 7	2,123	F	W	N/A		X	
0030-H	Maintenance Storage Shed 8	2,123	F	W	N/A		X	
0030-I	Maintenance Storage Shed 9	2,123	F	W	N/A		X	
0030-J	Maintenance Storage Shed 10	2,123	F	W	N/A		X	
0030-K	Maintenance Storage Shed 11	2,123	F	W	N/A		X	
0040	Cover-Host 1	800	F/P	S	N/A		X	
0050	Cover-Host 2	800	F/P	S	N/A		X	
0060	Cover-Host 3	800	F/P	S	N/A		X	
0070	Cover-Host 4	760	F/P	S	N/A		X	
0080	Cover-Host 5	760	F/P	S	N/A		X	
0090	Cover-Host 6	760	F/P	S	N/A		X	
0100	Cover-Host 7	640	F/P	S	N/A		X	
0120	Cover-Host 8	760	F/P	S	N/A		X	
0130	Restroom/Shower Building 1	396	?					
0140	Restroom/Shower Building 2	396	?					
0150	Restroom/Shower Building 3	513	?					
0160	Restroom/Shower Building 4	440	?					
0170	Hunter's Education Module	1,480	G	W/S	N	X		
0200	Air-gun Building	12,000	F/G	S	N	X		X
0210	Small Bore Office/Restroom	660	G	M	N	X		

Structure Inventory		General Information			Future Potential			
Code	Structure	S.F.	Cond.	Material	ADA Access	Remain /Rehab	Remove	Adapt
0220	Small Bore Range Canopy	16,975	G	S	N	X		
0230	Activity Center	2,992	G	M	Y	X		
0240	Activity Center Shade Canopy	680	G	S	N	X		
0250	Training Building	1,150	G	M	Y	X		
0260	Main Range Shade Canopy	680	G	S	Y	X		
0270	Main Shooting Range Canopy	10,000	G	S	Y	X		
0280	Main Range Office	1,396	G	M	Y	X		X
0290	Range Office Carport	680	G	M	Y	X		
0300	Pistol Range Target Storage	120	F	M/W	N/A	X		
0310	Pistol Range Shooters' Canopy	3,600	G	S	N	X		
0320-A	Running Boar Buildings A	288	F/G	M	N		X	
0320-B	Running Boar Buildings B	288	BUILDING HAS BEEN REMOVED				X	
0330	Running Boar Target Storage	180	G	M	N/A		X	
0340	Running Boar Machine Building	384	F	M/W	N/A		X	
0350	Running Boar Storage Building	180	G	M	N/A		X	
0360	Long Range Target Building	832	F	M/W	N	X		
0370-A	Long Range Storage Shed 1	360	P	M	N/A		X	
0370-B	Long Range Storage Shed 2	360	P	M	N/A		X	
0400	Rifle Silhouette Office/Restroom	640	G	M	N	X		
0410	Rifle Silhouette Shade (West)	1,440	G	S	N	X		
0420	Rifle Silhouette Shade (Center)	1,760	G	S	N	X		
0430	Rifle Silhouette Range Canopy	5,960	G	S	N	X		
0440	Rifle Silhouette Shade (East)	1,440	G	S	N	X		
0450-A	Silhouette Storage 1	300	G	S	N/A		X	
0450-B	Silhouette Storage 2	300	F					
0450-C	Silhouette Storage 3	300	F					
0460	Vehicle Storage Building	1,800	G	S	N/A	X		
0470	Bench Rest Range Shade 2 (East)	720	G	S	N	X		
0480	Bench Rest Range Shade 1 (East)	2,880	G	S	N	X		

Structure Inventory		General Information			Future Potential			
Code	Structure	S.F.	Cond.	Material	ADA Access	Remain /Rehab	Remove	Adapt
0490	Bench Rest Range Canopy	8,480	G	S	N	X		
0500	Bench Rest Range Office/Restroom	640	G	M	N	X		
0510	Bench Rest Range Shade 3 (West)	2,880	G	S	N	X		
0520	Bench Rest Range Shade 4 (West)	640	G	S	N	X		
0530	Practical Pistol Range Canopy	6,480	G	S	N	X		
0540	Practical Pistol Range Office/Restroom	640	G	M	N	X		
0550	Pistol Silhouette Range Canopy	7,200	G	S	N	X		
0560	Pistol Silhouette Shade Canopy	640	G	S	N	X		
0600	Archery Range Canopy	2,800	G	S	N	X		
0610	Archery Range Office/Restroom	920	G	M	N	X		
0620	Archery Range Shade Canopy	720	G	S	N	X		
0630	Archery Range Host Canopy 9N	1,056	F/G	S	N/A	X		
0640	Archery Range Host Canopy 10	1,056	F/G	S	N/A	X		
0650	Archery Range Host Canopy 11	1,056	F/G	S	N/A	X		
0660	Archery Range Target Building	1,800	G/E	S	N/A	X		
0670-A	Archery Range Storage Shed 1	965	P	W	N/A		X	
0670-B	Archery Range Storage Shed 2	965	P	W	N/A		X	
0670-C	Archery Range Storage Shed 3	965	P	W	N/A		X	
0670-D	Archery Range Storage Shed 4	965	P	W	N/A		X	
0670-E	Archery Range Storage Shed 5	965	P	W	N/A		X	

Note: *Condition:* G = Good; F = Fair; P = Poor;  
*Material:* W = Wood; S = Steel; M = Masonry

## **Appendix E.     Hazardous Materials/Lead Management**

**ARIZONA GAME AND FISH DEPARTMENT**  
**BEN AVERY SHOOTING FACILITY**  
**LEAD BEST MANAGEMENT PRACTICES PLAN**

JULY 6, 2006

## **1. INTRODUCTION:**

Arizona Game and Fish Department (Department) Ben Avery Shooting Facility (BASF) represents a valuable recreational asset to the citizens of Arizona and must be managed responsibly. Accordingly, the Department has developed this Lead Best Management Practices Plan (LBMPP) to ensure the proper management and/or disposition of lead at the BASF range facility. I

## **2. BACKGROUND:**

The Department owned BASF has been in operation since the late 1950's and is one of the most important public shooting ranges in the United States. The facilities at BASF include five archery ranges, a 14-field trap and skeet range, a sporting clay field and 12 ranges suitable for rifle and/or pistol use. The ranges have been constructed and remodeled during several episodes since the initial construction of ranges on the site, which occurred in the late 1950's including a major construction phase undertaken for the 1970 World Championships hosted at BASF. Since then, range facilities have been added, modified and relocated to keep pace with changing desires of range users and the requirements of new shooting sports.

## **3. ENVIRONMENTAL CONDITIONS:**

As a part of the development of the LBMPP, an environmental site characterization must first be developed. The characterization includes the assembling of information on soils, topography, weather, surface hydrology and geology. The results of this characterization are included in this section.

### **3.1 Topography**

The BASF site generally slopes to the southwest at a relatively shallow gradient from the toe of the hill on the northern edge of the property, which serves as a range backstop, to the southwestern corner of the site. The elevation of the site ranges between 1,600 feet above sea level to 1,700 feet above sea level at the toe of the hill to 2,185 feet above sea level at the top of the backstop hill.

### **3.2 Geology and Hydrology**

The subject property is located in an area of “old” alluvial deposits (Holocene to middle Pleistocene in age) in a present day valley and post glacial deposit.

Based on information supplied by the Arizona Department of Water Resources, the depth to groundwater is approximately 700 feet below ground level at the southern edge of the BASF site with a directional gradient of 230°, closer to the mountains, both the depth and directional gradient are undefined due to an absence of water wells in the site area.

### **3.3 Soils**

The southern portion of the BASF site consists of Ebon-Pinamt-Tremantl Association soils; clay and clay loam soils visible concentrations of lime in the subsoils. Soils of this association have a Ph range of 7.4 to 8.4 (slightly to moderately alkaline) and permeability between 0.2 to 2 inches per hour (low). The backstop hill consists of Celar-Lehman-Rock Outcrop; fractured bedrock with a Ph range of 7.8 to 8.4 and permeability between 2 to 6 inches per hour.

### **3.4 Rainfall**

The BASF site is located near the upper edge of the lower Senora desert with an annual rainfall of approximately 7.5 inches.

### **3.5 Conclusions of Environmental Characterization**

Based on the results of this environmental characterization and research on lead and arsenic transport described in the National Shooting Sports Foundation *“Lead Mobility at Shooting Ranges”* and *“Environmental Aspects of Construction and Management of Outdoor Shooting Ranges”* reports, lead and arsenic chemical mobility and hydrologic transport is extremely low in these environmental conditions and can be essentially ignored as a potential source of off-site lead transport.

## **4. PHYSICAL TRANSPORT**

In most shooting ranges located in Arizona, including BASF, physical transport which consists of the movement of lead/arsenic containing particles within and outside the shooting range site, constitutes the only significant mode for lead/arsenic movement.

The lead/arsenic containing projectiles, fragments, particles or lead/arsenic containing soil particles may be transported either by storm water runoff or if light enough as wind driven particles. Since lead containing particles are significantly heavier than other particles of similar dimensions, they travel significantly shorter distances when airborne and as long as good dust control practices are followed, any air borne transport will be insignificant. Therefore water borne particles are of primary concern as a potential source of off-site contamination.

## **5. CONTROL OF LEAD MOVEMENT**

During any construction activities at any range facilities, the control of fugitive dust through application of either water or other dust palliatives shall be required.

The movement of water borne lead/arsenic particles shall be controlled by placement of detention basins on watercourses downstream of the individual ranges. Detention basins shall be placed to intercept all storm water before it can exit the range property. Annual soil sampling shall be conducted in the detention basins to determine the rate of aggradation and lead content of the sediments in the basins. Based on the results of this testing, the basins shall be re-excavated, as required, to remove sediments and insure adequate capacity in the detention basins. Materials removed from the basins shall be placed in suitable secure areas within the range property.

## **6. ON-SITE LEAD EXPOSURE**

On-site lead exposure is most significant for those persons regularly exposed, therefore, staff regularly employed at the range will be required to take part in a quarterly blood testing program designed to monitor lead levels in their blood. Annual surface wipe tests of shooting benches and other surfaces shall be conducted to determine the levels of lead present on surfaces used by staff and shooters. To minimize possible ingestion of lead containing materials, range management shall ensure that staff does not eat, drink or smoke on active ranges. Any staff found to have blood lead levels in excess of Federal guidelines will be assigned to duties off the range until their blood lead levels have returned to acceptable levels.

## **7. LEAD RECOVERY**

On a biannual basis sampling and assays will be conducted in all impact and shot-fall areas to determine the quantities of lead present and the feasibility of conducting lead recovery. As the sampling program indicates it to be economically feasible, lead recovery operations will be conducted at individual range facilities to eliminate the long-term buildup of lead on the facility.

Recovery operations shall replace all berm materials or shot-fall surface materials to their original locations upon completion of lead recovery operations.

## Arizona Laws Lead/Hazardous Materials Information References

### **Lead Hazard, Mitigation, and Abatement**

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24. Violence Policy Center (2001) Poisonous Pastime: The Health Risks of Shooting Ranges and Lead to Children, Families, and the Environment. VPC.

### **Arizona Laws Pertaining to Shooting Ranges**

25. A.R.S. §17-601 through §17-621, Arizona Revised Statutes, 47th Legislature, 2nd Regular Session.
26. HB2586 43rd Legislature, 2nd Regular Session (1998)

## Appendix F. Agency Involvement

## Agency Workshop Summary

**Goal of the workshop:** Identify Values, Issues and Needs, Constraints and Opportunities for Master Planning Ben Avery Shooting Facility.

**Values Discussion-** Values were described as the elements that make the facility a special and unique place; the things that the facility feels strongly about retaining. Perceived values of Ben Avery:

- Diversity of user groups.
- Provision of more than just marksmanship (social, education, relaxation, etc.).
- An oasis of natural environment in surrounding urban landscape.
- Youth involvement.
- Public ownership and responsibility for the facility.
- Support received from user groups, volunteers, donors and sponsors.
- Credibility of users.
- Overall image and appearance.
- Presence of wildlife and habitat.
- Enhancement of quality of life to surrounding communities.

**Issues Discussion-** Issues were described as the matters about the facility that need to be changed or improved.

- Lack of adequate facilities and provisions for disabled visitors.
- Inadequate RV parking and amenities during major events.
- Waiting lines to get into the facility that result in traffic on Carefree Highway
- Waiting lines at the ranges.
- Classrooms are often too small or unavailable.
- Conflicts between user groups.
- Inability to have Trap and Skeet offered concurrently.
- Inadequate building space.
- Substandard signage and way finding ability.
- Drainage problems.
- Unreliable water system.
- Lack of fire protection (Fuel breaks, hydrants, sprinkler systems).
- Lack of security.
- Ranges not being used to their full potential.
- Inadequate range lighting.
- Inadequate separation of ranges.
- Lead management and removal.
- Inadequate satellite maintenance facilities.
- Ineffective use of real estate.
- Existing use of technology needs updating.
- Archery targets cause arrow damage.
- Aging infrastructure.
- Noise mitigation.
- Problems with the reservations process.

**Needs Discussion-** Participants were told that needs were the building blocks for a successful master plan. By identifying needs, the master plan can develop programs, procedures, and structures that anticipate and provide space and opportunity for satisfying growth trends. The list of needs below was identified during the discussion and may be used to address specific issues in the Final Master Plan.

- Better access.
- Safe places for children.
- Improved signage.
- Better traffic control and circulation.
- ADA compliance
- Improved main entrance.
- More RV sites.
- RV washing site.
- Dump station.
- RV and boat storage.
- Public camping.
- Area for non RV camping.
- Advertising.
- Better public perception and image.
- New sewer line.
- Connection to City water main.
- Improved lighting.
- Facilities for non shooters.
- Improved shaded and safe playgrounds.
- Visitor center or lounge.
- Restaurant, cafeteria or food stand.
- Day care.
- Shooting supply and sporting goods store.
- Covered grandstand and/or bleachers.
- Gun cleaning and storage areas (armory).
- Archery equipment assembly and storage areas.
- Additional restrooms dispersed throughout facilities.
- First aid station.
- Additional Sporting Clays and Trap and Skeet lines.
- Additional shooting positions at several of the ranges.
- Additional shooting bays.
- Improvements to targets.
- Indoor and outdoor shooting facilities for law enforcement.
- Multi-use ranges.
- Paintball Range or area.
- 100-200 foot Sporting Clays tower.
- Improved corral at cowboy shooting area.
- Rental meeting facility such as a banquet hall.
- Amphitheatre.
- Increased classroom space.

- Distance education through a media center.
- Paved parking.
- Equipment storage space for user groups.
- Improved security (perimeter fencing, closed circuit video, law enforcement patrols).
- Better internet presence and website.
- Dormitory housing.
- Solar and wind power.
- Fishable water feature.
- Sound buffering.
- Unifying aesthetic theme.
- Landscaping.

**Opportunities and Constraints** - Constraints were described as the factors that would hinder successful implementation of the master plan; opportunities were described as the factors that increase the potential for successful implementation of the Master Plan. The LSD team explained that the separation between constraints and opportunities was more in the planning perspective than in the actual implementation, because by knowing the areas of challenge the Master Plan can be built to make constraints work in its favor.

*Opportunities:*

- Development of the Master Plan as a guiding document.
- Credibility of the facility through continued use by law enforcement.
- Revenue generating programs such as grant monies, user fees, lessons and space rental.
- Lead harvesting and recycling.

*Constraints:*

- Limited hours of operation.
- Limited room for expansion.
- Physical constraints such as berms, walls and structures.
- Surrounding land uses.
- Cultural resources.

**Facilities Programming-** Programs were described as the functions the Ben Avery Shooting Facility should implement in order to make the master plan a success. They were also described as trends for which the facility should anticipate and plan. In addition to supporting and planning for these groups, the group agreed that pursuit of revenue-generating groups (such as clay target shooters) should go hand in hand with support of credibility generating groups (such as hunter education, athletic events, and youth programs.) Specific programs identified for improvement were the reservation system, customer service, service to disabled user groups and welcoming of non-club members or the average citizen who may visit BASF.

## **Appendix G.    Public Involvement**

## **G-1. User Groups Workshop**

### *General Recreation Values:*

- Desire for the facility to be friendly and family oriented.
- Preservation of the natural environment.
- Provision of opportunity for special users.
- Access for specific user group areas.
- Diversity of users and facilities.
- Multiple shooting uses.

### *Education Values:*

- Provision of public safety through education.
- Provision of training programs.
- Public safety training.
- Strong commitment to youth programs.
- Opportunities for young shooters to learn safe shooting practices.
- Affordable rates for youth shooters.
- Wealth of knowledge in a concentrated area.
- Existing knowledge base of users and staff.

### *Economic Values:*

- New and local monies to the valley from BASF.
- Existing partnerships between private entities, organizations, and agencies.

### *World-class Facility Values:*

- Desire and commitment to preserve the facility for future generations.
- Desire to build a world-class facility.
- 1970 World Shooting Championship.
- Numerous competitions.
- Shooter-friendly staff and management.
- Facility as attraction for local residents.
- Ability to easily facilitate a competition.
- Convenient location of range in a metro area, near an airport.
- Year-round use.
- Positive public perception.
- Ability to run state and national matches and still allow range to be open for other uses.
- BASF as a point-of-pride.
- Users like the way the range is run.
- Ability to shoot during the evenings.

## **Issues**

### *Use, Staffing, and Scheduling Issues:*

- Insufficient flexibility in usage areas.
- Increased user demands and scheduling.
- Movement of equipment between ranges.

- Schedule conflicts within ranges.
- Access to range and access to existing venues while ranges are in use.
- Public access for High-Power Range.
- Management of professional tournaments (staffing and scheduling).
- Inadequate RV parking facilities (process).
- Sufficient equipment/service staff to run matches and tournaments.
- Improper use of weapons on targets.

*Infrastructure Issues:*

- No proper storage facility.
- Not enough or inadequate lighting.
- Maintenance of roads, dust control, proper pavements for roads.
- Inadequate parking.
- Provision of staging areas.
- Inadequate pro shop for different users.
- Affordability.
- Provisions for physical needs of users.
- Lack of available food service on-site.
- Inadequate roll offs.
- Better access between BASF and Carefree Highway.
- Insufficient hours of operation to service users, especially during the summer months.
- Inadequate RV parking facilities (space).
- No place for or inadequate cowboy-mounted shooting facility.
- Poor maintenance on some ranges.
- Lack of portable restroom facilities that can be moved to various venues.
- Insufficient permanent restrooms.

*Education Issues:*

- Inadequate publicity to general public.
- Concern about risk of some ranges with the expansion of other ranges or other development.
- Public education about use of specialty ranges to minimize harm to or destruction of the specialty ranges.
- Knowledgeable and friendly line safety officers.
- Issue of enforcement of rules and operating procedures.

**Needs**

*Scheduling Needs:*

- Availability of bull's-eye and pistol ranges for night shooting.
- Maintenance of multiple types of shooting venues and users.
- Need for a seven-day-a-week facility.
- Need to keep range open for longer hours.
- Preserve the ability to shoot during evenings.

*Facility Needs:*

- Facilities to hold an Olympic-style event.
- Storage for targets and safes to store firearms on-site.

- Better RV facilities (RV hookups, 150 RV spaces) and campground updates.
- Comfortable and shaded areas, especially staging areas.
- Areas to accommodate non-shooters.
- Addressing opportunity for lessening noise levels.
- Building on other successful shooting facility designs.
- Benchmark BASF with other facilities nationwide.
- Fire-suppression equipment.
- Maintenance of buffer around facility to provide opportunity to expand facilities.
- Identification of opportunities to develop smaller shooting facilities to reduce demand pressure on BASF.
- Maintenance facilities to handle welding.
- Incorporation of indoor shooting and training facility at southeast corner.
- Space for administrative building that does not take away from other shooting facilities.
- Building for Arizona State Rifle and Pistol Association (ASRPA) staff and volunteers.

*Range Needs:*

- Preserve high-power range facility for world championship.
- Grassed area for prone shooting position (Small Bore Range).
- 100-points firing stations as a minimum (Small Bore Range).
- Stadium lighting at Small Bore and public ranges.
- Side berms to expand course design.
- Opportunity built in to remove spent shells from range and berms.
- Diverse shooting ranges for firing in regard to side berms.
- Provisions for electricity at each firing line.
- Water supply (drinking fountains) at each range.
- Frame holder (50 feet) for junior shooters.
- 2 target houses at each High-Power Range.
- Firing-point repairs at High-Power Range.
- Minimization of conflicts by moving staging areas.
- Communication at ranges during matches.
- Communication system between ranges and registration.
- Target-carrier repairs and other equipment.
- Retainment of specialized ranges.
- 50 Trap spaces.
- Development of Small Bore Range opportunities on southwest slopes.
- Addition of tower and live-shot shoot house.
- Live-fire shoot house.
- 300-meter range.
- Indoor 50-foot air-conditioned range for air-gun gun facilities.

*Access and Transportation Needs:*

- Carts to get around ranges.
- ADA access points to ranges, parking and registration.

#### *Education Needs:*

- Centralized education facility(multi-media ready; sufficient to handle concurrent training classes).
- Open-minded operation of facility by staff and an increase of staff safety awareness.
- Alternative funding to operate.
- Identification and use of management and expertise in planning.
- Increase of staff knowledge base.
- Preservation of existing partnerships between private entities, organizations, and agencies.
- Enhancement of education opportunities on-site.
- Maintenance of range presence, traditions, and positive public perception.
- Event publicity for local awareness.
- User friendly range for new users.
- Appropriate uses for different ranges.
- Better isolation between ranges.
- Storage facilities closer to individual ranges.
- Group of volunteers to help take care of BASF.

## **G–2. Focus Group Meeting**

### ***Parking/Transportation***

#### *Entry Location and Main Entrance:*

- Provide parking area, long turning lanes, or pull-off at entry for parking prior to opening of facility.
- Consider moving main entrance and kiosk to allow for better access.
- Pave interior roadways and day-parking areas, fill in potholes, and paint speed bumps.
- Provide a centrally located kiosk or a secondary access point.
- Improve kiosk/signage to post hours of operation, emergency numbers, and information at main entry points.
- Service entrance for user groups, specialty groups, and events only.
- Single access code for each group to prevent issues surrounding gate closures during off-hours and scheduled events.
- Consider separation of traffic and one-way travel beyond main entry to reduce congestion and access to individual ranges.
- Provide entrance at the end of High Power Range and move visitor center to end of High Power Range.
- Consider use of tollbooth entrance for check-in and traffic separation.
- Roads need to handle heavy equipment
- Have clay-target shooters access range from the west side (at new AGFD facility).

#### *Parking:*

- Connect parking areas with storage opportunities.
- Rifle range (west of High Power Range) needs additional parking (south of the High Power Range access road).
- Prevent parking directly along roads.
- Provide overnight RV parking for 200 RVs and keep separate from long-term RV parking.
- Provide 250 RV parking sites (especially November to May) with hookups for sewer, water, and electric (50 amp).

- Charge rent fees at RV sites, as well as institute a minimum-targets (shot) requirement to encourage shooters only.
- Use it to make money.
- Reduce parking costs (currently too expensive).
- Need to keep a percentage of RV sites for “event-only RV users”.
- Need 60 to 150 trailer spots each weekend.

*General Comments:*

- General traffic flow should be the same every day of the week.
- Parking/camping off-site away from the range.
- Golf cart paths.
- Clearly mark roads paths and trails.
- Availability to rent carts.
- Parking area for carts.
- Vendor area (in the middle).
- Consider using shuttles, flatbed trailers, and buses to move people.
- Groups can provide shuttles, but need BASF to provide shuttles for some larger events.

*High-power Range:*

- Overflow events use the high-power range for parking, limiting use of the range.
- Develop additional parking that is not on the High Power Range.
- Provide better signage when high-power range is in use or close off high-power-range split road permanently.
- Turns at the south end of High Power Range are too narrow/tight.
- Design roads around High Power Range to accommodate tractor-trailers.
- Provide road across the High Power Range, because a road around adds 1.5 miles.
- Do not close the road across the High Power Range permanently.

*Winter Range Event and Territorial Roundup (roughriders / cowboy shooters):*

- Need 4,000 to 5,000 parking spots for automobiles during their largest event.
- Additional events need space for 800 competitor vehicles, 1,000 spectator vehicles, and 200 RVs.

*Storage:*

- On-site, dedicated storage at each range for specialty groups.
- Pistol Silhouette has adequate storage.
- Rifle Silhouette needs storage.
- Storage areas need to be closer to ranges to eliminate need for large tractor-trailer access.
- Cowboy shooters want to be “multi-use,” but would like a permanent storage area for their own equipment.
- Consider increased trailer-based or permanent storage options.
- Department of Public Safety (DPS) needs secure armory to store 1 million handgun rounds/year and 7 million rifle rounds/year.
- Warehouse building for storage and maintenance.
- DPS storage on or near the facility, not necessarily right next to its range.

*Hunter Education Area Parking:*

- 300 cars entering Hunter Education area.
- Need paved parking for 300 or more vehicles with a separate entrance area.

*Transportation:*

- Need parking space for the 40- to 50-foot-horse trailers needed for mounted shooting.

*Ben Avery Clay Target Center:*

- Need sufficient parking (including RV space) and transport (shuttles, carts, and paths) to accommodate 1,500 shooters over 4 to 5 days.
- Need at least 200 parking spots for BACTC, April to May.

*Trap and Skeet:*

- Need transportation options along Trap/Skeet row.
- Same parking needs, just not as spread out.
- Provide for range vehicle access for movement of equipment down the line.
- Use farm tractors with beds to move people from “home” to line, and up and down line.

*Annie Oakley:*

- Would like vehicular access to travel “down range”.

*Archery:*

- Parking is adequate at FITA, would like a second driveway for in/out issues.
- Future Parking for an additional 300 to 400 people.
- Parking blocks and better parking layout.

*Mounted Shooting:*

- Provide parking spaces for 40- to 50-foot-long (or longer) horse trailers.
- Would like parking/RV camping to be dirt/gravel and closer to facility; water and sewer hookups optional.
- Provide space at dirt parking area for competitors to bring their own corrals/tie horses to trailers overnight.

**Facilities**

*Benchrest:*

- RV sewer and electric hookup.

*Trap and Skeet:*

- 150 full-hookup RV sites.
- 150 “dry” camping sites.
- Provide shade and water at each Trap location.

*AZ Rifle and Pistol:*

- Main goal of the range is shooting, and secondary goal is for education.
- Classrooms (for 50–60 students) should be centrally located and do not need immediate range access.

*Hassayampa Rod and Gun Club:*

- Need expanded pro shop.
  - Dedicated to shooting sports.

- Provide ammunition, targets, and earmuffs.

#### *ASRPA:*

- Ammunition locker at pro shop.
- Need to provide a larger armory for AGFD for range-owned guns located adjacent to main office and near the main range, hunter education area, and small bore and rifle areas.
- Shotgun Shooters need their own armory.
- Need to use new metal targets.

#### *Winter Range/Cowboy Shooters:*

- Possibly use Western/Arizona theme at BASF.
- Need own storage facility for steel targets on the west side of shooting bays (bays have 3 tons of targets).
- Need prop and target storage directly adjacent to existing range.
- The closer and more secure the storage area is, the better.
- New and improved bathroom facilities (120 shooters at monthly matches and 40 spectators, minimum total of 160 people).
- Need water, power, lights, clusters of restrooms, sewage dump station, and expanded camping space for at least 1,000 trailers.
- Large shaded area for large event gatherings.
- Need a 60- by 30-foot pole barn.

#### *Buildings:*

- Clubhouse with Pro Shop, snack bar, and additional seating areas.
- Office, meeting rooms, corporate group area, and registration area.
- Warehouse and maintenance building; storage area for targets, ammunition, gun parts, etc.
- "Solve a problem" building in RV park for cards, games, and laundry that is separate from clubhouse.

#### *Restrooms:*

- Need quality restrooms for sprawling facility.
  - In RV area.
  - All around courses.
    - Behind Trap/Skeet line.
    - Around Sporting Clays.
    - Portable toilets, at a minimum.

#### *Sporting Clays Area:*

- Secure storage area for carts.

#### *Rifle Silhouette:*

- More gun racks at line.
- Concrete benches at each end of range.
- More shade at waiting area.
- Permanent storage area for equipment.
- West end needs to be ADA accessible.

#### *New Education Center:*

- Expand/improve classroom facilities and provide storage for education materials closer to range.
- Provide dedicated facilities for National Rifle Association (NRA), Hunter Education, and Carrying Concealed Weapons (CCW) training.
- Provide for 40 to 60 students per classroom.
- New headquarters will have internal (limited use) conference rooms and a 200-person auditorium (available all hours).
- Classroom needs different than auditorium, ideally coupled with a 110-yard range.
- May be able to join with non-profit group currently fundraising for education space.
- Stat houses (with current classrooms) need to remain.
- Shared class/field use for CCW and Hunter Education, near existing Hunter Education area.
- Expand current buildings - have multiple facilities at different ranges.
- 2 to 4 classrooms for 60- to 80-person capacity.

#### *General Facilities:*

- Provide spectator seating with shade (with misting at some seating areas).
- Replace range furniture throughout BASF.
- Permanent restrooms and portable toilets.
- RV area support building.
- Potable water throughout range.
- Well-drained/maintained pedestrian and cart paths.
- Wood benches with shade and water.
- Improve Sporting Clays course tower presentations.
- Dirt mounding/berming/terrain changes on courses.
- Retail space / pro shop with retail license to sell ammunition to the general public.
- Power and hookups needed at all shooting bays and vendor areas.
- Permanent on-site food (hamburger/hotdog) and retail (only shooting related) areas.
- Restaurant-capable building.
  - Food, retail, classroom, pro shop.
  - Best placed in an area where you cannot expand a range.
  - Locate near main entrance.
- Range to fund select user group (ASRPA or other) to run pro shop (or use volunteers or other external commercial group).
- Air-conditioned volunteer lounge.
- Shade/picnic tables for non-shooters at every shooting point on all ranges.
- Current shade is not enough, especially at rifle and pistol range.s
- Provide movable bleachers.
- Put permanent facilities on city sewer line and remove from septic/leach fields.
- Power in shooting bays for electric target use.
- Lighting.
  - Use low-impact lighting.
  - Limit lighting outside the ranges, but have power available if lighting is needed.
- Adequate parking at any new facilities.
- Water and pump truck.
- Large dump station and pump truck.

- All ranges shaded and lit.
- Better waste management.
- Barracks, bunkhouses, and dormitories at archery.
- Provide permanent indoor bathrooms for all ranges (should not need to rent).
- Provide new Tournament Operations office- with air conditioning, Internet, classrooms, banquet space, kitchen, dining area, and storage.
- Retail and office space at archery area.
- Provide potable water throughout range facility.
- Shade structures
  - Along Trap line.
  - Throughout Sporting Clays course.
- Better maintenance of Sporting Clays pathway (for cart and pedestrian use).
- Provide benches that do not get hot in the sun.
- Provide gun racks at drinking fountains.
- Communication opportunities at all ranges.
  - Telephones and cell phones.
  - Partner new light poles with wireless capabilities.
  - Provide high-speed Internet.
  - “Red phone” (emergency phone) at every range with one direct line.

### ***Existing Range Improvements***

#### *Existing Range Improvements:*

- Width at the tops of range berming should be drivable.
- Better signage for newcomers.
- Provide scorecards/boards and range-layout information.
- Provide at least one small stat office/bathroom/classroom at each range, with electricity and water utilities.
- Improve dust control measures.
- Fire-suppression planning—City of Phoenix fire station nearby, coordinate with them to determine needs (water needs, water truck, etc.)
- Marksmanship/revolving target for NRA marksmanship.
- ADA accessibility.
  - Provide access to shooting bays throughout range.
  - Make benches ADA compliant.

#### *Hassayampa Rod and Gun Club:*

- Bunkers at rifle silhouette can be seen beyond the impact berms; raise the berms.
- Concrete roof on the bunkers to eliminate the current rattlesnake/scorpion hiding spots.
- Create a permanent traverse area over the berms.

#### *Clay-target Center:*

- Finish Trap/Skeet line.
- Provide lighting on executive Sporting Clays course.
- Towers on main course.
- Terrain improvements.

- Portable toilets at far end of range.
- Finish clubhouse.
- Bulletin post for “what’s happening” information.
- Pattern board at far west end.

*Archery:*

- Provide lighting on targets and range.
- Waterproof all shade structures.
- Provide tables.
- ADA-accessible FITA Range.
- Flagpole.s
- PA system and “hot range” lights (red, yellow, green).
- Timer/course clock.
- Stabilize west bank of wash with stone armoring.
- Reduce and prevent further erosion.
- General-practice archery and broadhead users need better targets (to not ruin arrows).

*Practical Pistol:*

- Better lighting, similar to main range.
- Stadium lighting in all shooting bays and extended into shooting bays E and F.
- Electricity at each bay for electric targets.
- Shade for shooting bays A and B.
- Solve drainage problems in Practical Pistol bays.
- Expand berms.
  - West of shooting bay A.
  - Far end of shooting bay F.
  - To maximum extent possible.
  - Design of range in terms of how games played.
  - Various angle.s
  - Floors of bay.
  - Impact berms.
  - Height of berms.
    - North and south berms raised to higher dimensions would like to be maintained through bay F.
    - Berms at 200-meter point on pistol silhouette should be raised, especially for development along Archery Road for ranges.

*Scheduling/Administrative Issues:*

- Open range to public during matches when bays are available.
- Lighting needs to be manually controllable (lighting would open up range for more night matches).
- Practical Pistol scheduling issue.
- Expand hours on public range.
- DPS currently has weekend scheduling conflicts.
- Balance DPS and public use on range.
- Scheduling conflict with CCW and non-competition shooters on Small Bore Range.

- Rifle and Pistol Silhouette ranges cannot run national matches because target space not guaranteed.
- Staffing needs to be improved.
- Veteran's or Disabled Veterans Day.
- Establish "no cell phone" policy while on the range.
- Need manager for the different user groups that camp.

*Public Range:*

- More points on public range for 200 or 300 meters.
- Night shooting on public range.
- Look at rear berms for rounds that are hitting ground in front of targets, shooters shooting down at targets on ground, etc.
- Open 300-meter Olympic range.
- Keep 100-meter line separate from 200- and 300-meter lines.
- Improve berms to NRA safety standards.
- Need stadium lighting in all bays.
- Shading for bays A and B.
- Power source at line and down range of line.
- Improve side berms (impact resistant for angle shots).
- Range division barriers.
- Flooring improvements.
- Deal with drainage concerns.

*Department of Public Safety:*

- Needs more room for longer range (300-meter minimum).
- Currently has weekend scheduling conflicts.
- Would like armory to be located on BASF.
- Anticipates 3 times the current use, especially with future collaboration between DPS and Phoenix Police Department.
- Balance DPS and public use of range.

*Trap and Skeet:*

- Provide 40 or more traps to accommodate increased use over time.
- Anticipates up to 7,000 shooters/week in near future.

*Benchrest:*

- Need range expansion to 300 yards.
- PA system and "live-fire" lights.
- Range separation walls and berms between bays to expand capacity.
- Roof improvements at shooting bays.
- Add 12 to 20 more benches on range (with shade structures).
- Deal with drainage issues.
- Replace targets.
- Provide storage space and an armory option.
- Provide new access route (because only access is currently through DPS range area).

*Winter Range/Cowboy Shooters:*

- Straining current facilities.
- Ranges need to have more lateral and down-range movement (allocation for more space).
- More separation of bays.

*Pistol Silhouette:*

- Lateral berm improvements.
- Enhance berm at 200 meters.

*High-power Range (1,000 yards):*

- Improve bays to 50 points and move toward 100 points.
- Needs station markers.
- Firing mounds needed at:
  - 200 meters.
  - 300 meters.
  - 600 meters.
  - 800 meters.
  - 900 meters.
  - 1000 meters.
- Include “number bricks” at firing mounds.
- Added storage in pits.
- Light line at every firing line.

*Hunter Education Area:*

- ‘Over-brow’ shielding on ranges.
- Lighting needs on range and Hunt Simulation area.
- Improve/relocate access to Hunter Ed. Range.
- Double the current size of Simulated Hunt Area to equal “live-fire” area.
- Anticipates use will at least double in near future.

*Small Bore:*

- Maintain 100-yard, 100-point range.
- Move impact berm and prevent erosion behind 100-yard point.
- New target stands at 50-yard and 100-yard locations.
- Re-establish turf-lined range.
- Silhouette lighting.
- Consider relocating range elsewhere to site in north-facing direction and not have scheduling conflicts.
- Expand current range to 100 bays (200 is ideal) and 100 yards long.

*Precision Pistol:*

- Provide shade over shooting line.
- Lighting needs.
- Consider relocation of Precision Pistol Range.
- Provide turning targets.
  - 25 yards (NRA).
  - 25 meters (Olympic).

- Provide fixed targets.
  - 50 yards (NRA).
  - 50 meters (Olympic).

*Rifle Silhouette:*

- Need lateral movement options at 200-yard bay.
- Bunkers need safety improvements (steel/concrete roofs).
- Anticipates increased use with current facilities.
- Provide opportunities at 100 or 200 yards where shooter can run laterally along a line and shoot into targets.

*Pistol Silhouette:*

- Cowboy Silhouette increases current use of range; must provide lighting to expand use capacity.
- Growing, but at a slower rate than other groups.

*Cast Bullet:*

- Cannot host national matches with current number of shooting bays.

*All Groups:*

- Provide spectator seating and shade throughout.
- Provide firearm preparation, inspection, and cleaning area.
- Berming improvements to NRA standards throughout BASF.

*Air-gun Range:*

- Need repairs.
- Remove existing storage from range facility and return area to 100-points range.
- Need air conditioning.
- Need room for equipment setup.
- Provide room for spectators.
- Olympic-style electronic targets.

***Future Range Improvements***

*General Discussion:*

- Specialty range (100 yards for experienced, certified shooters).

*Winter Range/Cowboy Action:*

- Would like to propose a Western-themed range.
  - Minimum of 14 bays (with 4–6 bays having permanent structures).
- Could collaborate with mounted shooters to develop new range.
- Western-themed range would use existing topography and desert vegetation.
  - Some permanent structures.
  - Building facades and “mission” to create impression of a Western town.
  - 50-foot-wide by 50-yard-deep bays.
  - Long range as well 300-yard by 500-yard range.
- Also consider hosting cowboy clays (although could overlap Sporting Clays).

*High-power Range:*

- .50-caliber range.
- Bring back 300-meter firing mound.
  - Olympic style.
  - Removable shooting house.
  - NRA match certifications.

*Precision Pistol:*

- Consider relocation of Precision Pistol Range.

*Practical Pistol:*

- Could collaborate with Winter Range / cowboy action shooters.
- Need facilities to meet criteria for hosting national matches.
- Consider new range to allow varying angles of fire (lateral and down-range movement).
- Would like a practical-pistol shoot house on range (see map for proposed location).
- Could bring national-level event here, but need 18 to 24 shooting bays.

*All Groups:*

- Night-vision goggle-use range.
- Provide sound mitigation as a design parameter.
- New .22-caliber indoor Olympic-style range.
  - 50 meters.
  - 2-story building.
  - 10 bays/floor.
  - Pistol capable.
  - \$1 million future facility.
- New general-purpose range (capacity for 100 or more people).
- New indoor range.
- New bull's-eye range.
  - 25 or 50 yards and 25 or 50 meters.
  - Turning target at 25 meters and 25 yards.

*Trap and Skeet:*

- Expand range to 34-36 bays (currently at 17).
- Skeet houses are adequate (currently at 14).

*Mounted Shooting:*

- Two 150- x 300-foot arenas (ideal).
- Mounted field-trials area.

*Shotgun:*

- 2 to 3 extra ranges to host national event.
  - Provide new "Helice" shooting range.
  - 1-acre minimum.
  - Olympic style.
  - Separate from existing Sporting Clays area.
  - Could be overlaid on an existing field.
- Need 2 to 3 new Sporting Clays courses.

- 15 shooting stations each.
- Crossing targets with ability to progress from 20 to 50 yards from target.
- Ability to get closer to target.
- Ability to change target presentation on a daily basis.

*Distinguished Expert Range for Women:*

- Targets must be 1 foot apart.
- Specific space requirements.
- Site near main range.

*Benchrest:*

- Anticipate increase of two times the current use.

*DPS:*

- Expanded ranges.
- Warehouse/large simulation area for day/night scenarios.
- Armory on-site.
  - Collaboration with Phoenix Police Department.
- Multi-level, simulated shooting house.
  - Explosive entry simulation.
  - Frangible ammunition.
  - Movable walls and rooms.
  - Steel sliders as separators and target mounts.

*Pistol Silhouette:*

- Needs more banks for Olympic-style events.

*Small Bore:*

- Consider relocating range elsewhere (in north-facing direction) to avoid scheduling conflicts with public range.

*Rifle Silhouette:*

- Needs 10 banks of animal silhouette (BASF currently has 8).

*Archery:*

- Indoor 9-meter Archery Range.

*Air gun:*

- Add new, electro-mechanical carriers to range.
- Air-gun building.
  - Re-claim old Air-gun building / training facility.

### G-3. Public Open House Summary

#### *General Comments:*

- Need to accommodate the "next big thing".
- Losing shooting area to berms should be top design priority.
- On site storage is an issue.
- Parking is an issue for simultaneous events.
- Spectator comfort and concessions need to be improved.
- Power and lighting need to be addressed.
- Speed bumps are excessive.
- Need additional restrooms.
- Want all day hours back.
- Need more meetings before final design.
- Include year or season pass to fee schedule.
- Have electronic vending machines dispense targets, target dots, ear protection and other consumables.
- Don't understand intention of the insertion of the 100 yard, 40 point range between DPS Range and Rifle Silhouette Range. Costs would be enormous.
- Target setters for public 600 meter range will be in 10 degree cone of safety from the High Power Range target line.
- Need a large Bullseye Pistol Range in Arizona.
- Creation of a movable turning target mechanism that can be installed on a general purpose range for bullseye pistol should be included in the plans.
- Consider a dedicated police department range.
- Consider development of Small Bore Range.
- Need additional first-aid, AEDs and emergency phones at ranges.

#### *Camping, RV:*

- Improved RV and Primitive camping areas look great.

#### *Main Range:*

- Expand main range to 200 yards at all points.

#### *Cowboy Action Shooters:*

- What happened to permanent CAS area?
- Many more CAS than Mounted shooters.

#### *Cowboy Mounted Shooters Associations:*

- Ben Avery is a great venue for Cowboy Mounted Shooters, please expand permanent facilities.
- Vast support of mounted shooting facilities.
- Too much space being utilized for mounted shooters, conserve space for additional trap and skeet.
- Mounted events occur only once a year.
- One arena should be covered.

*High Power Range:*

- No physical division of the High Power Range, as it would preclude certain events.
- Expand High Power Range to true 100 point range.
- Concerned at overlap between High Power Range and Rifle Silhouette Range.
- Address needs of Bench Rest users behind 1000 yard firing points. Add Canopies.
- Do not need road through High Power Range.
- Would activity on the High Power Range curtail use of the High Power Silhouette Range?
- Maintain firing lines at 200, 300, 500, 600, 800, 900, 1000 yards, with benches at 1000 yards.
- Move overflow parking to behind 600, 800 and 900 yard lines.

*Pistol Ranges:*

- Where is 2700 Pistol Range going?
- Practical Pistol needs more than 4 bays.
- Proposed configuration of Practical Pistol precludes certain events.
- More lights for night shooting on Practical Pistol.
- Where are pistol pits? (for IPSC, etc.).
- Need more data on the Pistol Range. Steel Targets? Resettable from the bench? Moving Targets?
- Pistol Silhouette Range will be uncomfortably unsafe with 40 yard and 100 yard range.

*FITA Range:*

- FITA Range needs to be expanded and improved.

*Broadhead Walk-Thru:*

- Replace Broadhead course with a three dimensional course.

*Rifle Silhouette:*

- The plan has no understanding or care for Rifle Silhouette.
- Moving 500 meter range in line with 600 meter public range has no use.
- Would have to rebuild every Small Bore stand.

*Sporting Clays:*

- I like the Sporting Clays layout.